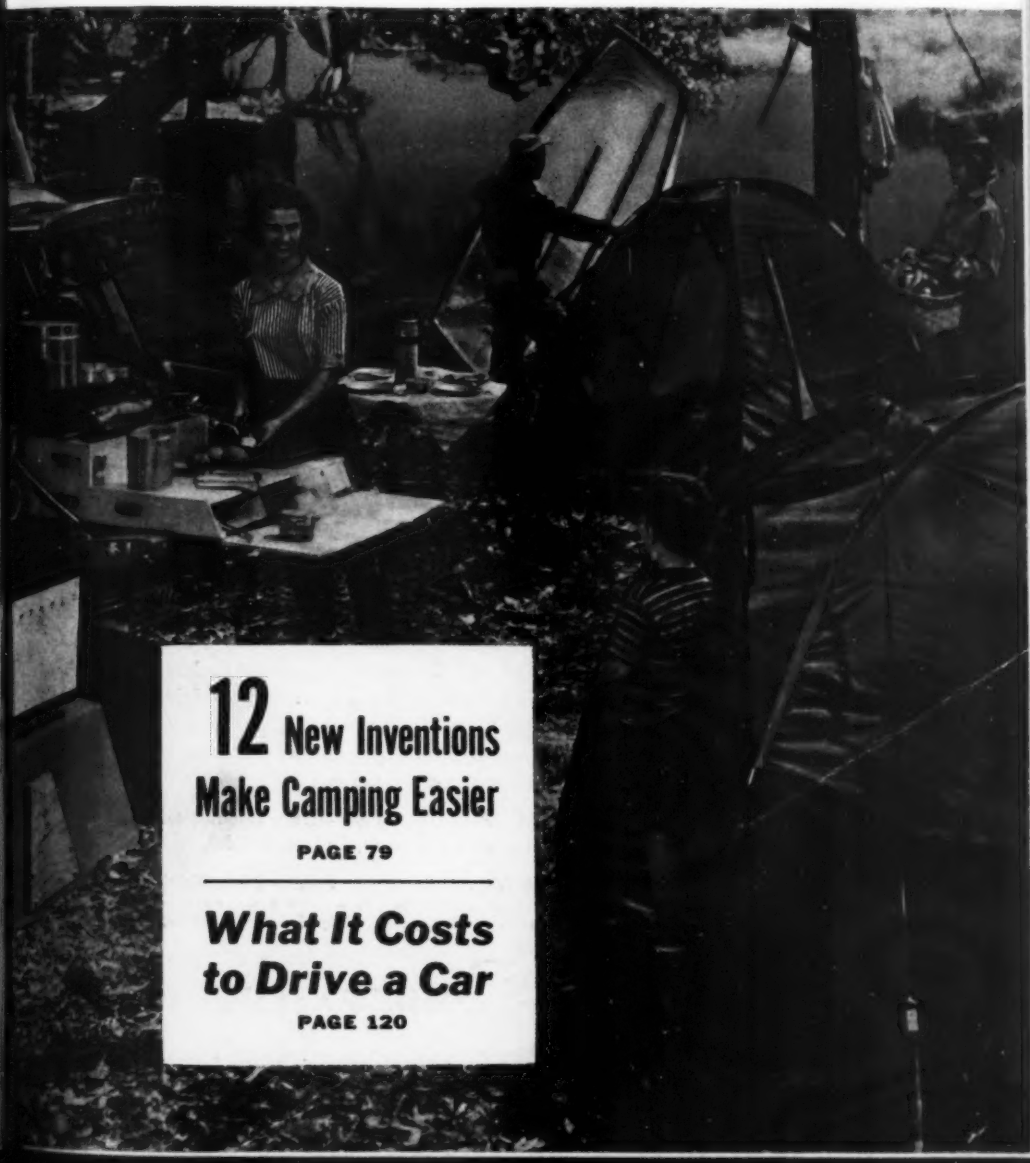
"I Fly Twice as Fast as Sound" SEE PAGE 74

Desk.

POPULAR SCIENCE

UNIVERSITY OF MICHIGAN
MAY 29
PERIODICAL READING ROOM

June 35c MONTHLY



12 New Inventions Make Camping Easier

PAGE 79

What It Costs to Drive a Car

PAGE 120

See what DEPENDability has done for Eve!

No Other

OUTBOARD MOTOR IS BUILT LIKE A JOHNSON SEA-HORSE. NONE! THE MANUFACTURER WHO HAS BUILT MORE OUTBOARD MOTORS THAN ANYONE ELSE, HAS MORE EXPERIENCE IN BUILDING THEM BETTER. THAT'S

Johnson!

9 MODELS · THE JAVELIN (30 hp.)
SEA-HORSE 30, Electric or Manual
SEA-HORSE 15, Electric or Manual
SEA-HORSE 10 · SEA-HORSE 7½
SEA-HORSE 5½ · SEA-HORSE 3

The Johnson Sea-Horse is a *family* motor. For a very good reason. It's DEPENDable. Ask commercial users. They choose Johnsons, and *work* them—hour after hour, year after year—*the very same models you buy for pleasure!* Yes—DEPENDability makes Johnson the family motor. See the nine new models for '56—all smartly styled in Johnson's new Holiday Bronze—all *quiet*—and featuring quicker, smoother starting than you've ever known before!

FREE! Write for the Sea-Horse Booklet on 1956 models and features. Complete, factual, helpful.

JOHNSON MOTORS, 500 Pershing Rd., Waukegan, Illinois
A DIVISION OF OUTBOARD, MARINE & MANUFACTURING COMPANY
In Canada: Manufactured by Johnson Motors, Peterborough

Johnson SEA-HORSES ARE DEPENDABLE

Don't guess about your oil filter!

Get a FRAM "INDIVIDUALLY-ENGINEERED" CARTRIDGE

FULL-FLOW OR BY-PASS—EACH TYPE OF FILTRATION DEMANDS A DIFFERENT CARTRIDGE—FRAM HAS BOTH!

FRAM FULL-FLOW CARTRIDGE

MOST NEW CARS HAVE FULL-FLOW FILTRATION

Full-flow cartridges require a flow-rate ten to fifteen times as great as by-pass cartridges. Some filter manufacturers recommend using a depth type cartridge—this is dangerous! These cartridges raise oil pressure and force relief valves open . . . feeding dirty, unfiltered oil to engine parts. On the other hand, inferior surface type cartridges have too high a flow rate for efficient filtration. Only FRAM full-flow cartridges are designed to maintain the exact flow rate for peak filter efficiency.

FRAM BY-PASS CARTRIDGE

MANY CARS STILL HAVE BY-PASS FILTRATION

FRAM Cartridges are best for by-pass systems too. This type of system requires a depth type cartridge —not pleated paper or other surface types. Inferior cartridges cannot clean oil thoroughly. FRAM by-pass cartridges are designed to supply the proper flow of clean oil to the engine at all times.

YOUR DEALER CAN TELL YOU WHICH SYSTEM YOU HAVE. FULL-FLOW OR BY-PASS, FRAM CARTRIDGES ARE INDIVIDUALLY-ENGINEERED FOR YOUR CAR'S ENGINE. INSIST ON FRAM!

FRAM®
OIL · AIR · FUEL · WATER
FILTERS

FRAM CORPORATION, Providence 16, R. I.
Fram Canada Ltd., Stratford, Ont.

Founded in 1872,
Vol. 168: No. 6

POPULAR SCIENCE
Mechanics and Handicraft
REG. U.S. PAT. OFF.

America's Leading New-Idea Magazine for 84 Years

JUNE, 1956

What's This About Britain's Mystery Car?.. 67
"I Fly Twice as Fast as Sound"..... 74
12 New Ways to Camp in Comfort..... 79
Gun Tests 7,000-M.P.H. Missiles..... 85
Can We Steer Hurricanes Away?..... 86
One-Man Observatory Spies on Pheasants.... 90
Jets Shoot for New Records..... 94
Tiny Rooms Show U. S. History..... 98
Engine Has Four Pistons in One Cylinder....104
Daredevil Boatmen Challenge Ghost Ship....107
What's New in Communist Countries.....112

Report to Motorists
Keeping You Out of That Traffic Jam.....114
1,866 Miles of Toll Roads Beckon '56 Vacationers.....117
What Does It Cost You to Drive a Car?.....120

USS *Forrestal* Launches Jets with Steam.....124
The Lumberyard Known 'Round the World..130
This Station Wagon Is a Scooter.....138
Gus Baits a Trap.....142

FOR THE HOME MECHANIC

How to Build Your Own Garden Furniture..145
Making an Old Fan Look New.....153
Prefabs Make Barbecue Building Easy.....157
Play Equipment That You Can Build.....163
Now Automation Can Run Your House.....167
Trim Hedges the Quick Way.....173
New for Camera Fans.....176
9 Uses for Plastic Bottles.....177
It's Vapor-Lock Season Again.....178
Transistor Portable Plays 45's Anywhere....183
Contract Jobs Are His Business.....187
How to Make Your Satellite Spotter.....193

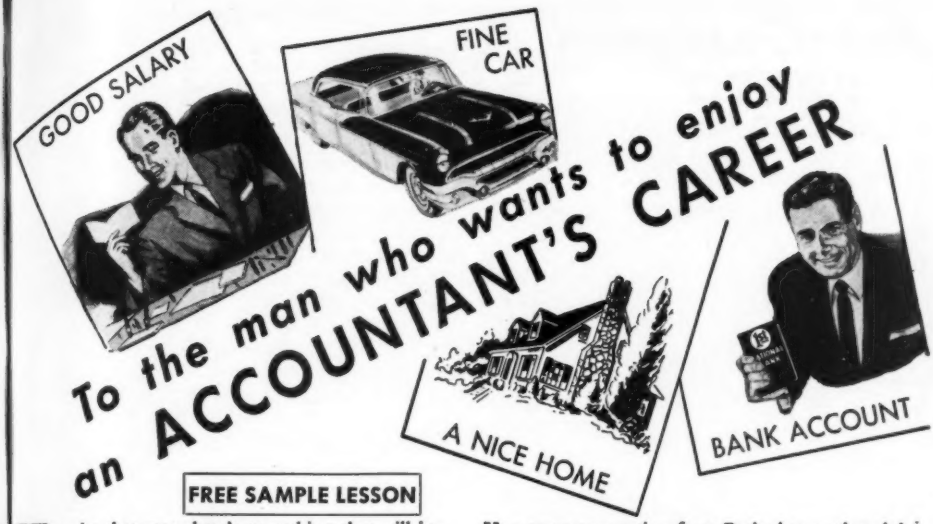
(More features and departments are listed on page 4)

Editor
VOLTA TORREY
Managing Editor
HOWARD ALLAWAY
Art Editor
HOWARD C. JENSEN
Associate Editors
Alden P. Armagnac, Devon Francis, Martin Mann, Herbert O. Johansen, Sheldon M. Gallager, Henry B. Comstock, Herbert R. Pfister, Stanley Beitler, Frank Dorr, Erik H. Arctander, Ruth Westphal
Art
Harry Samuels (Director), Herbert Anthony, Gene Butera, Eric A. Karminski Jr., Henry W. Kazmirowski, Dana B. Rasmussen
Copy
Kendall W. Goodwyn (Director), Everett H. Ortner, Maryann Smith, Georgette Sparks
Photography
W. W. Morris (Director), Hubert Luckett, Orlando Guerra
Assistant Managing Editors
Frank Rowsome Jr.
Robert P. Stevenson
Mechanics and Handicraft
Harry Walton
Pacific Coast Editor
Wesley S. Griswold (Los Angeles)
Midwestern Editor
Joseph Dorlaque (Chicago)
Editorial Assistants
Rosa Lee Beeland (Chief), Louise Levis, Bebe Lipson, Roberta Marks
Publisher
GODFREY HAMMOND
President
RALPH H. FLYNN
Advertising Manager
LEE P. ADAMS
Circulation Director
EUGENE WATSON

ADVERTISING OFFICES:
NEW YORK—353 Fourth Ave.
CHICAGO—360 North Michigan Ave.
DETROIT—820 Book Bldg.
SAN FRANCISCO—114 Sansome St.
CLEVELAND—636 B. F. Keith Bldg.
LOS ANGELES—1127 Wilshire Blvd.
PORTLAND, ORE.—520 S.W. Sixth Ave.

EDITORIAL OFFICES: 353 Fourth Avenue, New York 10, N. Y.

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, Chairman of the Board; Ralph H. Flynn, President and Treasurer; Franklin E. Parker Jr., Secretary; Eugene Watson, Vice-President. Second-class mail privileges authorized at New York, N. Y., and Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A.
Copyright, 1956, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all the countries participating in the International Copyright Convention and Pan-American Copyright Convention.
Single copy 35c. Subscriptions to United States, its possessions, and Canada, 1 year $3.40 (2 years $6.00, 3 years $8.00). Elsewhere, 1 year $6.00 (2 years $11.00, 3 years $16.00). Four weeks' notice is needed to change a subscriber's address. Please give both old and new addresses, including postal zone numbers.



To the man who wants to enjoy an ACCOUNTANT'S CAREER

FREE SAMPLE LESSON

IF you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of $4,000 to $10,000 and up?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing!*

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an Accounting position?

Just suppose you were permitted to work in an accounting firm under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex — soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

Over 4,200 Certified Public Accountants among LaSalle alumni

You cover accounting from Basic Accounting right through Accounting Systems and Income Tax Procedure. As you go along, you absorb the principles of General Accounting, Auditing and Basic Cost Accounting. Then you may choose Commercial Accounting, Industrial Accounting or Public Accounting and prepare for the C. P. A. examinations.

Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained*. It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Get Free Sample Lesson—Also "Accountancy, The Profession That Pays"

For your own good get all the facts about this completely new and modern accounting training. Write for Free Sample Lesson—also latest book "Accountancy, The Profession That Pays." They will prove that Accounting offers brilliant futures to those who aren't afraid of serious home study, and will show the wide range of opportunities that exist today. No cost or obligation. If you want a position of higher income, greater prestige and professional standing ...MAIL THE COUPON NOW!

Member, National Home Study Council

LASALLE EXTENSION UNIVERSITY
A CORRESPONDENCE INSTITUTION

417 S. Dearborn St. Dept. 683H Chicago 5, Ill.

I want to be an accountant. Send me without obligation, Free Sample Lesson—also "Accountancy, The Profession that Pays."

Name.....*Age*.....

Address.....

City, Zone & State.....

Job-Designed! PROTO

Professional-Quality Pliers for Your Needs!

NEW! Multiple-Groove Joint Utility Plier. Gives you a wide range of openings for hundreds of jobs. 242-7½" and 243-9½". ***NEW! Mighty Midget Plier for Electronics.*** You'll like the feel of these pliers for working on small objects or in tight places. 6 models, 4" to 4¾". ***NEW! "Snip-Grip" Plier.*** Plastic inserts in cutting edges hold end of wire after you cut it. Prevents electrical shorts, protects you from injury. 204T-4½"; 206T-6". ***NEW! Electronics & Ignition Cutting Plier.*** Cutter is close to tip. Spring opens long narrow jaws. 224G-6". ***Also NEW! Comfortable "Handeze" Plier Grips.*** Slip on easily, fit tight, are long wearing. Reduce fatigue. ***NEW! V-Notch Wire Stripper.*** Two V-notches cut through insulation, slight side pressure strips it. 298-5⅛".

And . . . the Sensational Multi-Plier!
Increases grip 10 times!
"A Chest of tools in one." 234-8".

All recent additions feature the outstanding "professional quality" of the broad PROTO plier line. Fine alloy steels, sturdy construction, carefully fitted joints, correct leverage, properly shaped teeth, positive cutting edges, ease of operation. See the PROTO plier line at your dealer's, or send 10¢ for catalog of entire line to **PROTO TOOLS** 2205 Santa Fe Ave., Los Angeles 54, Calif.

Eastern Factory, Jamestown, N.Y.
Canadian Factory, London, Ont.

5682

PROTO TOOLS
PROTO means PROfessional TOols

News and Pictures

Small-Screen TV Comes Back..... 71
Atomic Worker Wired for Sound..... 71
Cabler Weaves 217 Wires into One..... 72
Tunnel Makes 18,000-M.P.H. Waves.... 72
Window Shopper Can Now Buy..... 73
Tractor in Barge to Dredge Canals..... 73
X-Ray Gets Every Tooth with One Shot.. 78
American Motors Shows Its Newest Cars 78
Turbine to Speed Amphibious Landings 84
Gauge Measures Thickness of Paint..... 84
Plan Would Remodel Waikiki for Tourists 89
Auto Engine Has Eight "Pots"..... 89
Want to Buy a Ford at 86 Horsepower?.. 91
Lift Stacks Cars in Parking Space..... 92
Three-Cylinder Auto Hits 70..... 92
Camera Tests Appeal of New Packages.. 93
Nine Cylinders Yield Record Power..... 93
Radar to Direct Canada's Air Traffic.....103
Electricity Shifts Motorcycle Gears.....106
Italians Have Roll-Top Convertible.....106
Recruits Get Realistic Targets.....111
Truck Unloads Feed Through Hose.....111
New for Boatmen.....123
Radar Puts Plane Data on Screen.....128
Camera in Train Shows What's Ahead....129
Post Office Goes Electronic.....134

Mechanics and Homebuilding

Louvered Awnings Dress Up House.....152
Walk Made of Colored Cinder Blocks....156
Saw Clamp Steadies BX.....156
Beach Windbreak Is Made of Canvas....161
Bric-a-brac Shelves Decorate Garage.....161
Plant Box Lined with Lead Flashing.....182
Base of Tires Protects Lumber Pile.....202
Pillbox Dispenses Stamps.....202
Simple Knot Holds Fishline.....202
Sailors Put Amplifiers on Bread Pans.....214
Pack Frame Eases Scout's Load.....216
Putty Ring Protects Can Lip.....216
Circle Stamp Made from Hose.....216

Departments

Letters 10
Craftsmen at Work..... 60
PSM Late News..... 62
I'd Like to See Them Make..... 64
New Ideas from the Inventors.....135
New Aids to Living.....140
Wordless Workshop.....154
New for the Handyman.....162
Keeping the Home Shipshape.....171
New Shop Ideas.....191
New Tools.....204
Hints from the Model Garage.....206
New for Your Car.....210
Do It the Easy Way.....214

J. E. SMITH
President, National Radio Institute. 40 years' experience training men at home for Radio-TV.

I Will Send You A

SAMPLE LESSON FREE

to show you how easy, practical it is to

Train at Home for Good Radio-Television Jobs

Make $10, $15 a Week Extra

Many men I train fix neighbors' Radios, make extra money, soon after they enroll. Actual equipment you build gives you practical experience.

America's Fast Growing Industry Offers You Good Pay Plus a Bright Future

TRAINING plus OPPORTUNITY is the PERFECT combination for ambitious men. Let me send you a sample lesson from my course to prove you can keep your job while TRAINING at home in your spare time for better pay and a brighter future. I will also send my 64-page book to show you that Radio-Television is today's field of OPPORTUNITY for properly trained men.

Television's Growth is Making More Jobs, Prosperity

Radio is bigger than ever and television is growing fast. Government, Aviation, Police, Ship, Microwave Relay, Two Way Communications for buses, taxis, railroads are other growing fields for Radio-Television trained men.

Mail Coupon—Find Out About This Tested Way to Better Pay

Take NRI training for as little as $5 a month. Many NRI graduates make more in two weeks than the total cost of my training. Mail coupon today for Actual Lesson and 64-page Book—Both FREE. J. E. SMITH, National Radio Institute, Dept. 6FB, Washington 9, D. C. Our 40th Year.

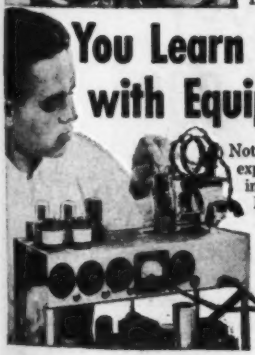
I Trained These Men

"I have a regular job as a police captain and also have a good spare time Radio and Television service business. Just opened my new showrooms and shop."—C. W. LEWIS, Pensacola, Florida.

"I decided to quit my job and do TV work full time. I love my work and am doing all right. If fellows knew what a wonderful investment NRI is, they would not hesitate."—W. F. KLINE, Cincinnati, Ohio.

"Thanks to NRI, I operated a successful Radio repair shop. Then I got a job with WPAQ, later WBOB and now am an engineer for WHPE."—VAN W. WORKMAN, High Point, N. Carolina.

You Learn by Practicing with Equipment I Send



Nothing takes the place of practical experience. That's why NRI training is based on LEARNING BY DOING. My training includes kits of parts which you use to build equipment and get practical experience on circuits common to both Radio and Television. Shown at left is the low-power Broadcasting Transmitter you build as part of my Communications Course.

AVAILABLE TO **VETERANS** UNDER G.I. BILLS

Good for Both—FREE

Mr. J. E. Smith, President, Dept. 6F B
National Radio Institute, Washington 9, D.C.
Mail me Sample Lesson and 64-page Book, FREE. (No salesman will call. Please write plainly.)

Name_____ Age_____

Address_____

City_____ Zone____ State_____

VETS write in date of discharge_____

Approved Member, National Home Study Council

Years-ahead Quaker State gives lasting protection to your car!

Super-refined from Pure Pennsylvania Grade Crude Oil, world's finest. Famous for performance, protection, economy! Try it!

QUAKER STATE OIL REFINING CORP., OIL CITY, PA.
Member Pennsylvania Grade Crude Oil Association

Can You Identify These Plates?

My current hobby as an amateur photographer is collecting those advertising slogans and pictures that now appear on many automobile license plates. Here are a few that other POPULAR SCIENCE readers may

have fun trying to identify if you print them with the names painted out. [*Editor's note: Answers on page 12.*]

Some of these I got by keeping an eye peeled for out-of-state plates in the parking lots at an Air Force base and an Army hospital near here, knowing that military people get transferred quite often. The ones

Look *Forward* to carefree summer driving

Wherever you go, there's MoPar

Get a MōPAR Vacation Checkup Now

at any Plymouth, Dodge, De Soto or Chrysler dealer and at better repair shops everywhere

6-point MōPār check list for cars with "the forward look"

1. LIGHTS
2. BRAKES
3. STEERING
4. COOLING
5. VISION
6. LUBRICATION

Are you sure your car is in shape for summer driving? Why wonder and worry—be sure with a MoPar Vacation Checkup!

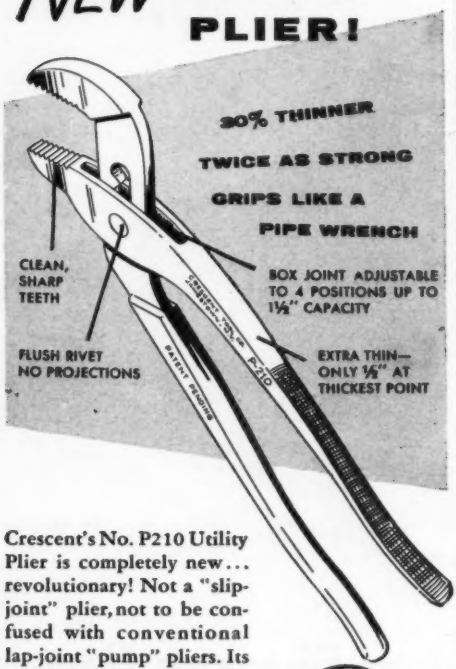
You're sure of service from factory-trained mechanics. You're sure of trouble-free MoPar parts—the only parts engineered especially for Plymouth, Dodge, De Soto, Chrysler and Imperial cars and Dodge Job-Rated Trucks. They're guaranteed by Chrysler Corporation!

Going north, south, east or west? Drive carefree with a MoPar Vacation Checkup!

MōPAR

CHRYSLER CORPORATION PARTS DIVISION

NEW UTILITY PLIER!



Crescent's No. P210 Utility Plier is completely new... revolutionary! Not a "slip-joint" plier, not to be confused with conventional lap-joint "pump" pliers. Its double-strong box joint design is absolutely unique. It will grip flat, square, hex or round objects with powerful leverage. Handsomely finished in rust-resistant zinc plate.

QUICK, POSITIVE ADJUSTMENT

This cut-away view shows joint construction with its extra generous bearing surface at the arrow point.

$3.00 Sold by hardware stores everywhere.

Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

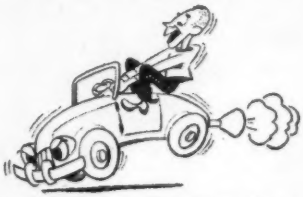
with just zeros for numbers are samples that I obtained by writing to motor-vehicle bureaus.

J. B. Guss, Denver

The license plates pictured on page 10 are, from top to bottom, those of: North Dakota, Georgia, Ontario, Wyoming, Alaska and Illinois.

In Defense of Hot-Rodders

I object to Lt. Rambow's slighting reference to the "back-alley hot-rodder" in your letters column for April [p. 20]. For his information, a true hot-rodder is not a person with "several carburetors and the



largest megaphone exhaust on the market."

A hot-rodder is a person who is interested in achieving the utmost in mechanical perfection. Multiple carburetion is only one way of increasing the efficiency of an automobile engine.

Warren Kirkland, Winnetka, Ill.

Will U. S. Appliances Work Abroad?

Your reassuring answer to the Navy man who wanted to take his household appliances abroad missed a point [Feb., p. 20]. Doesn't the automatic washer have an electric-clock-like timer to control the cycling? Won't it take 60 minutes for every 50 minutes' worth of work if you run it on 50-cycle current instead of 60?

Donald H. Rogers, Ivyland, Pa.

You're right. To maintain proper cycling on such things as clothes washers and dishwashers, it would be necessary to replace the rotor or the gear train in the timer with one designed for 50-cycle operation.

Note on the Good Old Days

I guess they aren't making elk-horn chairs the way they used to. The chair you showed [Jan., p. 92] doesn't look as substantial as the one that was presented to Abe Lincoln on Nov. 26, 1864, by Seth Kinman, a noted California trapper. I have an original Brady photograph of the Kinman job.

Abe Brayer, Bronx, N. Y.

you don't baby a *Cadillac*

Cadillac all-aluminum boats are light, fast and virtually indestructible . . . require no upkeep! Pound it in rough water, beach it on gravel or stones — there's no wood to gouge, rot or splinter. Cadillac outperformed 12 leading makes 6 ways in independent tests — gives you more go per h.p. Car-top models take up to 16 h.p. motors . . . do-it-yourself accessories available.

WRITE FOR FREE literature.

CADILLAC MARINE & BOAT CO.
176 Seventh St., Cadillac, Michigan

FIREARMS & SWORDS

You don't want to miss our new thrill-packed catalog. Fascinating background and illustrations of 1800 authentic pieces. Exceptional values in hard-to-find items. For your 175 page catalog #29 simply send 50c to cover postage and handling with your name and address.

ROBERT ABELS, Box PS, 860 Lexington Ave., New York 21, N. Y.

RADIO CONTROL YOUR MODEL

PLANES BOATS CARS

"CUSTOM MIDGET" RADIO ONLY **$9.98**
LICENSE FREE BAND
OPERATES SAME AS $50.00 SETS INCLUDES LONG RANGE TRANSMITTER RADIO, RECEIVER RADIO AND CONTROL ACTUATOR ALL 3 EASY ASSEMBLY WITH OUR PARTS AND PLANS $9.98. PLANS ALONE $1.

DETAILED INFORMATION & RADIO CATALOGUE 25c
SPECIAL "SUPPLY SOURCE DIRECTORY" & $7.00 SUPPLY COUPON $1.00
BOOK "RADIO CONTROL OF MODEL AIRCRAFT" CONTAINS 16 PLANS $3.98
RADIO CONTROL GARAGE DOOR DETAILS $1.00

RADIOMODELS BOX 36 DEPT. PS BALTIMORE 6, MARYLAND

BUILD Outdoor or Indoor **BARBECUE** Fun for Family and Friends

No limit to design for garden, patio or kitchen. All metal unit serves as masonry form. Ends guessing! Efficient. For charcoal or wood. Durable. Units $24.95 up. See dealer or write.

MAJESTIC COMPANY, INC.
483 Erie Street
Huntington, Ind.

Do-it-Yourself Booklet — including designs and ideas. Send only 25c handling cost

LEFAX TECHNICAL DATA BOOKS

POCKET SIZE • LOOSE LEAF

Printed on loose leaf, 8 hole, 6¾"x3¾" bond paper, each book contains about 140 pages of technical data, condensed, accurate, essential, for engineer, technical worker, student, business man. **$1.25 each**

Architecture	Surveying	Mech'l Drawing	Metallurgy
Home Heating	Surveying Tables	Machine Design	Hydraulics
Illumination	Highway Eng'g.	Machinist's Data	Radio
Electrician's Data	General Math	Mech. of Materials	Television & FM
Builder's Data	Math Tables	Pwr. Trans. Mach.	Electricity, AC
Lumber Data	Physics	Thermo. Tbls. & Charts	Electricity, DC
Air Conditioning	Trig-Log Tables	Phys. & Thermo. Data	AC Motors & Gen'trs.
Building Constr.	Gen'l Chemistry	Metals	Transformers, Relays & Meters
Reinf. Concrete	Chemical Tables		
Piping Data	Analytic Chem.		

Write for FREE catalog (2000 listings). See how helpful LEFAX can be to you. Send $1.25 book, or $6 for any five books to

LEFAX PUBLISHERS, Dept. PS-2, PHILADELPHIA 7, PA.

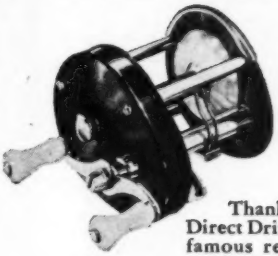
"GET IN WHERE BIG ONES LURK WITH Bait Casting Tackle!"

says W. E. Johnson of Duluth, Minn.

FIRST WITH BAIT CASTERS!

Shakespeare

DIRECT DRIVE REELS WITH LQT* NYLON GEARS



No. 1926
Feather-light, sporty, in green anodized aluminum. Tough and rugged for all fresh-water use . . . **$12.00**

Thanks to the amazing Direct Drive principle, these famous reels out-cast and out-last ordinary reels! Only *two* LQT* nylon gears . . . and a rugged one-piece shaft with *two* bearings . . . give Shakespeare DIRECT DRIVE reels the smooth, quiet performance, and dependability that make them *preferred!*

*LIGHTER, QUIETER, TOUGHER nylon gears are lighter than metal, quiet as a cat on a carpet . . . and *hundreds of thousands* in use prove they outwear metal gears! Try one soon—at your dealer's.

No. 1924S
Chrome-plated brass, for light salt water and heavy-duty fresh water use. With star drag crank. Priced at only **$13.50**

Free! NEW 1956 "TIPS and TACKLE" BOOK-PAK WITH POCKET FISHING CALENDAR

Catch more fish! These 4 new books show ways to fish, where to find 'em, tackle for:

SPINNING • BAIT CASTING
FLY FISHING • SALT WATER

SHAKESPEARE COMPANY
Dept. PS-6, Kalamazoo, Michigan.
Please send, FREE, new 1956 "TIPS and TACKLE" booklets and Joe Godfrey pocket fishing calendar.

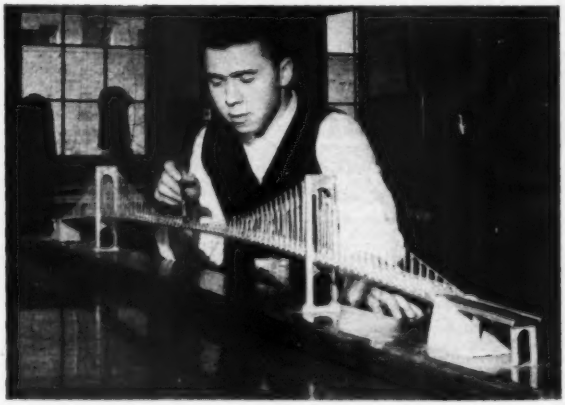
Name_____
Address_____
City_____ Zone____ State____

Have *you* recently completed a project of which you are particularly proud? Send a good picture, with the negative and a brief description, to POPULAR SCIENCE MONTHLY's Mechanics and Handicraft Editor, 353 Fourth Ave., New York 10, N. Y. We will pay $10 for each item accepted.

Craftsmen At Work

Models in Bulbs. Robert Searight of Long Beach, Calif., builds tiny scenes with tiny people inside discarded light bulbs. He has filled several hundred bulbs of all sizes this way.

Motorized Mower. A ⅓-hp. electric motor does the work when Frank Young of Lakewood, N. Y., mows his lawn. The motor is mounted on the handle of his old hand mower, geared to the wheels by a bicycle chain and sprocket plus belts and pulleys.



Balsa Bridge. Nearly 700 bits of wood were glued together for girders of this miniature of New York City's Bronx-Whitestone Bridge. Students at New York University made it.

IDEAS FROM WELDWOOD

THIS MONTH'S PROJECT – LAWN CHAISE

Here's the way to soak up the sun in style! This form-fitting chaise is extra comfortable and so easy to build. (See coupon for Easi-Bild Pattern*.) It's a handsome addition to your lawn furniture . . . and even comes apart for easy storage or for carting to the beach. You'll find it's a good idea to build two of them . . . because they'll be in demand all summer long.

And you'll find it's an extra good idea to make your chaise with either Weldwood exterior plywood or with amazing new Weldwood Duraply®. New Duraply is easy to work, gives you clean edges. And Duraply has a special tough facing that will save you paint. Needs no priming coat! Two coats on Duraply's super-smooth surface actually give the same coverage as 3 coats on ordinary wood. And the paint will stay new-looking longer. The overlay face is completely weatherproof, too. You'll have no fear of the rain damaging your chaise.

*T. M. Reg. Easi-Bild Pattern Co.

The Weldwood Question Box

Q. I want to finish off a playroom. How do I go about putting wood paneling over a concrete-block wall?

A. First make sure walls are dry and no moisture problem exists. Then put up your furring strips (1" x 2" pine)—horizontal ones every 16"—vertical ones every 4'. Vertical strips should be placed so the joints of the paneling will fall on them. Use wooden shims behind furring where needed to make all the furring strips even. To attach furring strips to concrete block, use anchor bolts or cut nails. After furring is in place, nail the paneling right to it—or better still, use Weldwood Contact Cement and avoid nail holes in the wood face. Leave about ⅛" space between bottom of panels and floor, for air circulation.

Q. Planning on painting some fir plywood. How can I keep grain from showing through?

A. That's simple. Prime the plywood with a coat of white Firzite. Firzite is specially designed to seal wood pores and help tame unsightly grain. Sand lightly, and apply finish coat. Use white Firzite as an undercoat for paint or enamel. For varnish or stain finishes use clear Firzite.®

HAVE A QUESTION?

Send it to "The Weldwood Question Box," 55 West 44th St., N. Y. 36, N. Y.

This Month's Hints

1. Putting an addition on the house? You can save time and trouble with Weldwood fir plywood for sheathing, subflooring, and roof-decking. Plywood makes a very strong and rigid structure . . . goes up fast . . . holds nails well . . . and there's almost no waste.

2. Screws put into the edge of a piece of plywood should be just long enough to take a ¾" bite into the wood. Shorter screws won't hold securely enough . . . longer screws won't add much, if any, strength to the joint.

$10 for your ideas

for "This Month's Hints", if accepted for publication. (Hints *must* apply to some Weldwood product.) Send them to Weldwood Hint Editor, 55 West 44th St., New York 36, N. Y.

Weldwood

Weldwood®

A product of

United States Plywood Corporation

Weldwood—The Best Known Name in Plywood

United States Plywood Corporation, Pattern Dept.
P. O. Box 215, Pleasantville, New York

Enclosed find 35¢ for which please send me Pattern #324—Lawn Chaise. PS6-56

NAME.....

ADDRESS.....

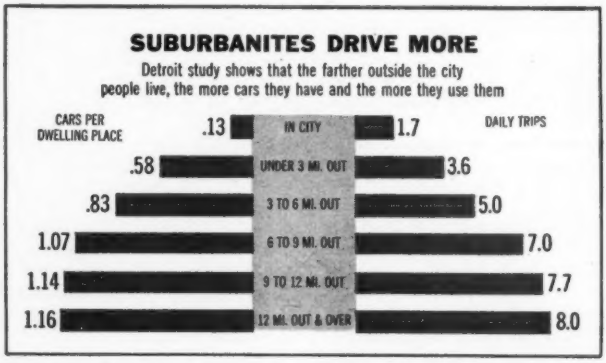
CITY.....STATE.....

POPULAR SCIENCE MONTHLY

LATE NEWS...

The atomic-powered airplane will soon be abuilding. The Air Force has ordered the plane itself from Convair, and has allotted $11,400,000 to start building a runway—three miles long—for it near Idaho Falls, Idaho. An operating reactor has already flown experimentally in a B-36. It does not power the plane, but is used to study problems of shielding crew and equipment against radiation.

Fish navigate by the sun, just as bees and birds do, reports Arthur D. Hasler of the University of Wisconsin. He found that minnows in a tank quickly learned to use an artificial sun—a light bulb—to locate a food dish. The fish were also good at remembering landmarks: scratches on the tank wall, water pipes, etc. Hasler previously showed that salmon use their keen sense of smell to find their spawning grounds, identifying the home stream by its faint but characteristic odor.



Workshop inventors still give the high-powered organized laboratories a run for their money, a study by Prof. Jacob Schmookler of Michigan State University indicates. Dr. Schmookler says that a fourth of all patented inventions are the work of independent individuals. About a third of all inventors have no training in science or engineering; nearly half do not have college degrees, the study found.

Frozen batteries are being stocked by some garages. The batteries are stored in regular kitchen freezers until sold. This maintains their charge much longer, according to Bowers Battery & Spark Plug Co., Reading, Pa.

Radar watches your speed in every part of the Union. There are now 1,398 sets in use, the AAA says. Ohio leads all other states with 174.

An artificial star that lasted about 10 minutes was created by Air Force scientists. They shot nitric oxide gas 60 miles into the sky with a rocket. This gas caused free oxygen atoms to combine into oxygen molecules and emit light. At first the flash was twice as bright as Venus, then it grew until it appeared four times as big as the moon. The Air Force says: "The experiments may lead to means of extracting this energy for the propulsion of rocket ships."

Pill for diabetes? A chemical related to the sulfa drugs reduces blood sugar and may relieve *some* diabetics of the need for daily shots of insulin. Called Orinase, it was discovered in Germany and is being developed by Upjohn Co., but is not yet on sale.

Over-the-pole air travel is planned by two U.S. airlines, Pan American and TWA. The North Pole route would save as much as 15 hours and 1,074 miles on flights from the West Coast to London. Polar flights are already operated by Scandinavian Airlines.

Good book. Dr. John R. Pierce, director of communications research for Bell Labs, is also J. J. Coupling, top-ranking author of science fiction. Pierce/Coupling's newest work, *Electrons, Waves and Messages* ($5, Hanover House, Garden City, N.Y.), is not fiction, but a sound introduction to the wonders of electronics.

At Bonneville Salt Flats . . .

Records Prove Top Performance of Auto-Lite Original Service Parts

31,224 miles of **continuous** driving averaging 92.86 mph.! 306 official A.A.A. records, including 27 World's Unlimited Records, shattered! That's the record set by an Auto-Lite equipped 1956 Dodge at the famous Bonneville Salt Flats, Utah. And in those 14 blistering days and nights of continuous driving, not a single electrical failure occurred.

This amazing performance by the complete Auto-Lite electrical system . . . standard factory equipment on the Dodge . . . is important to every car and truck owner. When new electrical units are needed on your Auto-Lite equipped car, make sure you get Auto-Lite Original Service Parts. It's your guarantee of full power performance.

Engineers of many leading makes of America's finest cars specify Auto-Lite complete electrical systems as original equipment. That's sound support for your decision to insist on Auto-Lite Original Service Parts.

Whether it's a contact set, coil, condenser, distributor or voltage regulator, you can be certain of top performance if it's backed by world-famous Auto-Lite ignition engineering. Get these same race-tested electrical parts for your Auto-Lite equipped car.

Get full power performance with . . .

AUTO-LITE

Original Service Parts

ORIGINAL AUTO-LITE SERVICE PARTS

Auto-Lite manufactures over 400 products, including Spark Plugs, Batteries, Wire and Cable, and Automotive Electrical Systems . . . sold throughout the United States and Canada.

Everyone has his own pet idea of a gadget that he would like to see in general use. These five ideas were suggested by POPULAR SCIENCE readers. What is *yours?* We will pay $5 for each one published. Please use Government postcards only. Write your name and address clearly. Contributions cannot be acknowledged or returned.

I'd like to see them make...

A SHOWER CURTAIN that could be pulled down or raised like a window shade. Cleaning the tub would be easier with no curtain dangling in the way.—*Troy Claffin, Pensacola, Fla.*

REAR WINDOWS ON STANDARD CARS that could be pushed outward like those on station wagons and some taxis. You'd get a lot better ventilation in hot weather.—*C. W. Manning, Ovid, N. Y.*

SPADE HANDLES scaled in feet and inches (counting from tip of blade) so you could tell how deep you've gone when you're digging holes.—*Edward Breslin, Central Islip, N. Y.*

A LUMINOUS SHUTTLECOCK for playing badminton after dark. This would be much less expensive than installing lights around the court.—*Ronnie Artz, Middletown, Pa.*

A DASHBOARD-MOUNTED VISOR to cut glare from the car's hood. In the late afternoon, this reflection can be as troublesome as direct sun rays.—*Richard W. Enz, Prescott, Ariz.*

POPULAR SCIENCE
REG. U. S. PAT. OFF. Monthly

What's all this about

Britain's Mystery Car?

Harry Ferguson drops a few clues about his new car. Probable features: new braking, steering, suspension.

By David Scott DRAWINGS BY STEWART ROUSE

LONDON

WHEN Harry Ferguson, the highly respected British inventor, let it be known last year that he was working on a revolutionary new car, speculation about it built up to a scale comparable to that aroused by Princess Margaret's recent romance. Since Ferguson is a successful and highly original designer, curiosity spilled out swiftly.

Ingenious mechanics. While at this writing the answers are not all in, two facts have grown increasingly clear. One is that the speculation has been deliberately stimulated, as part of a calculated plan. The other is that some intriguing and ingenious mechanical designs are in the offing.

Harry Ferguson is a crusader whose first passion was to bring cheap food to the masses with less drudgery for farmers. At the start of World War I, this Irishman, then 30, developed the rudiments of the "Ferguson system" for hitching implements to a tractor. His idea was to put the plow's weight on the rear wheels, not just dragging behind.

This greatly improved wheel grip, while permitting a much lighter and more economical tractor. By 1935 he had perfected the system with hydraulic linkage, automatic depth control and other features. Now the system helps farmers everywhere.

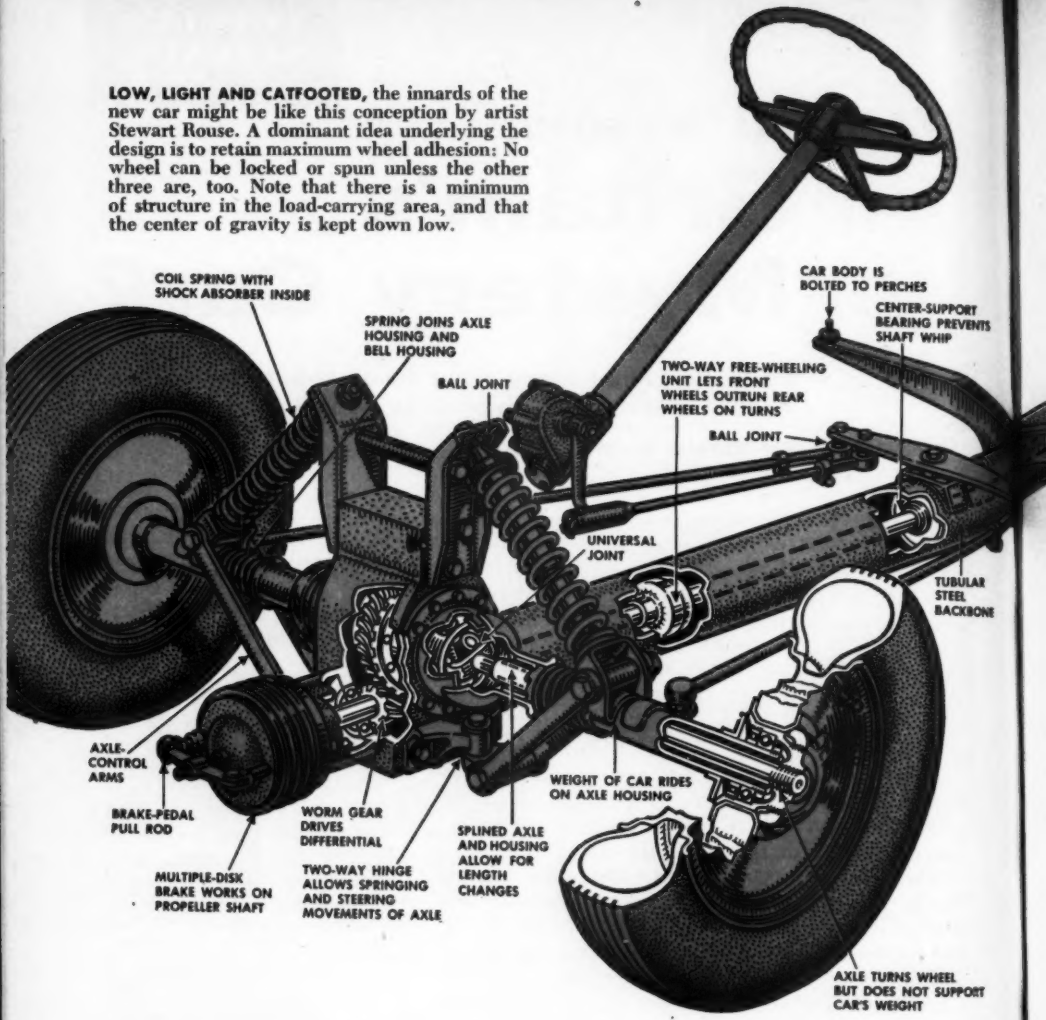
Showmanship. But Ferguson is also a shrewd publicist. Once, when pressing his "more food" campaign, he drove a tractor around the ballroom of Claridge's, London's ritziest hotel. Today the build-up for his new vehicle project is thorough and well organized.

He believes that propaganda plays a fundamental role in any operation, and accordingly he works with a high-powered public-relations agency. Pegged to the magic name of Ferguson, stories are

COASTER-WAGON STYLE, the new car may steer by pivoting the front half-axles about the "backbone."

SWINGING UPWARD, all wheels are independently sprung. The geometry minimizes changes in track.

LOW, LIGHT AND CATFOOTED, the innards of the new car might be like this conception by artist Stewart Rouse. A dominant idea underlying the design is to retain maximum wheel adhesion: No wheel can be locked or spun unless the other three are, too. Note that there is a minimum of structure in the load-carrying area, and that the center of gravity is kept down low.



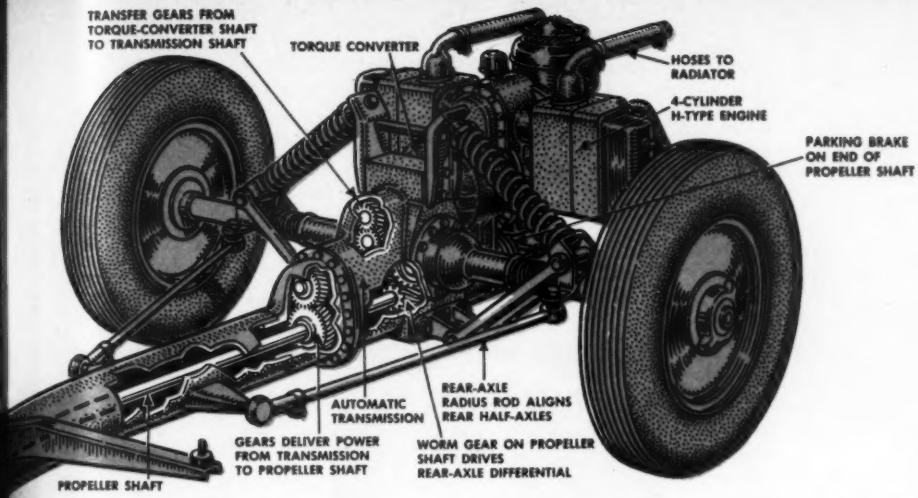
carefully "leaked" to the press about a revolutionary new type of car. They get a big play.

Hiding in hedges. For all the publicity, hard facts are difficult to pin down. Harry Ferguson Research Ltd. does its experimental work at an abandoned airfield a hundred miles from London. Newsmen have hidden in the surrounding hedges for days at a time, like patient hunters sweating out a flight of ducks. Their reward has been little more than sneaked views of lumpy machinery shrouded under dust covers.

One widely circulated "inside story" described the car as having a hydraulic turbine on each of the four wheels, supplied with oil under pressure from a common pump. This was supposed to assure smooth getaway and exceptional traction, since torque was fed evenly but independently to all wheels. Balanced, nonskid braking was to be effected by reversing the flow to the turbines, opposing rotation.

Ferguson laughs at such reports, describing them as "highly inaccurate." Yet he doesn't mind, for they are more grist for his publicity mill.

Hitting close to truth. But he gets



concerned when published accounts of his car hit too close to truth. The story he is understood to have been worried most about was carried in a reputable British magazine, *The Economist*. This is the hottest clue yet, for it outlines the rudiments of a chassis that closely resembles some fascinating designs patented by Harry Ferguson Research Ltd. in 1951, and recently revealed.

The account that allegedly annoyed Ferguson because of its accuracy said that "the four-wheel drive is not based upon individual drives or turbines for each wheel, nor is there any question of braking by some reversal of hydraulic force. Braking is by inboard disk brakes fitted to a mechanical transmission, automatically distributing the braking force to each wheel through the differentials.

"This inboard system, dispensing with brake drums and simplifying the anchorage of the wheels to the chassis, lightens the whole chassis and in particular the unsprung weight. The four-wheel independent springing uses vertical coil springs. Any engine one likes to use can go more or less where one likes . . ."

Patent shows way. The specifications included in the original Ferguson patent follow this description in detail. While the changes undoubtedly made in the past five years are a carefully guarded secret, it's a fairly safe bet that the basic concepts still hold.

The chassis consists of a tubular backbone housing the propeller shaft. Favored position for the engine and transmission seems to be at the rear. Wheels are carried independently on swinging half-axles, and joined to the fore and aft differentials by universal joints.

The steering is thoroughly unorthodox, unless you think of a horse-drawn cart (with two half-axles). Front axles pivot laterally through a wide arc on these same inboard joints. A brake acting on all wheels is fitted to the propeller shaft. Worm-drive differentials with an underslung shaft allow the brake to be carried on a forward extension of the backbone.

Engine astern. The rear-mounted engine is believed likely to be an opposed four-cylinder one, its compact size limiting rear overhang. An unusual constant-mesh gearbox was originally described. But since Piero Salerni, inventor of the Salerni automatic transmission, has since linked up with Ferguson, it is now believed that a hydraulic torque converter and automatic gearbox may be envisaged.

Dividing the propeller shaft between the front and rear axles is a double-acting free-wheel device. It enables the front wheels to overrun the rear ones during a turn, when they have farther to travel.

Little spin and lock. In addition, the rear wheels cannot spin unless the front ones do also. And the device keeps all

wheels under power when reversing. This reflects Ferguson's determination to maintain good road adhesion under all conditions.

Another instance is the single brake, acting on all four wheels. This should reduce the risk of skidding, for the retarding force is inherently equal all around, and no wheels can lock as long as one of them keeps on turning.

The brake itself is made up of a stack of intermeshed disks, alternately fixed and rotating, which are mechanically compressed to give braking. Since it operates on the drive shaft before the worm reduction gear, it handles a much smaller torque than wheel brakes would. Placed centrally at the front of the vehicle, it is not only easily cooled by onrushing air but is also readily accessible for inspection and for servicing.

HARRY FERGUSON, a highly successful inventor, has built a reputation on stubborn originality. His new car may be like nothing ever seen before.

Less bounce. The design reduces unsprung weight to no more than that of the wheels themselves and about half their axle assemblies. Thus traction is still further improved, for the lesser moving mass means less shock and less wheel bounce on a bump. Smaller springs and shock absorbers are needed to handle the reduced energy, and they will give a smoother ride.

Front and rear suspension systems are basically identical. Inclined coil springs enclosing the shocks cushion the vertical movement of the half-axles.

Axles change length. To minimize variations in track width as the wheels swing up and down—another cause for poor road adhesion and of rubber-destroying tire scrub—the axle changes in length to compensate somewhat for upward wheel travel.

A splined coupling is fitted to each half-axle. The hollow outer housing is made in two pieces joined by a heavy coil spring. Its outer part is retained by a radius arm linked to the base of the differential. Its geometry causes the wheel to slide in slightly with upward movement and out with downward. Thus the arc described by the wheel during deflection is substantially flattened.

For steering, the front-suspension assembly is arranged to permit fore and aft swing of the axles. Radius arms and spring mounts are pivoted and ball-jointed to allow this. The actual steering movement comes from struts linked to a tiller bar, controlled by a conventional steering gear.

Likely improvements. These are some of the principles that will probably find a place in the future Ferguson design. Some improvements and modifications can certainly be expected. For example, hydraulics may become more prominent, perhaps in the suspension and in the brake.

For Harry Ferguson, now 72, these concepts are the culmination of a long career that started in 1900 when he repaired racing cars in his garage. He thinks in broad terms—of basic components that may be used in a jeeplike military vehicle, or a cross-country car, or an ultra-safe family sedan.

He is now negotiating with several British and American companies to find a suitable manufacturer. Further details will not be disclosed until a deal is signed, which may be this fall. The talks are taking time, for Ferguson wants to see his ideas mass-produced on an immense scale—so that his new form of transport can benefit millions. END

Spinning Dial Opens the Door

You have to know the right numbers to get through this door. It's the entrance to the office of the NCO Club at Yuma AFB, Ariz., fitted with a phone-dial combination lock invented by S/Sgt. Raul DeHoyos. Dial correctly and you're in.

Small-Screen TV Comes Back

You can tote this 13-pound TV set out onto the patio or off on vacation. The nine-inch picture tube is packed into a case 8½ by 9½ by 13¾ inches. A rabbit-ear antenna folds out of the way when the little GE set is being carried.

Atomic Worker Wired for Sound

The masked workman above is wearing head antennas and a throat mike to report "hot" areas in a plutonium plant. Readings taken on the round detector are radioed to a distant tape recorder.

Cabler Weaves 217 Wires Into One Line

THIS planetary cabler was developed to bundle into a single cable the jungle of conducting wires and hydraulic and pneumatic lines required in launching and guiding missiles. It combines up to 217 lines in a cable ranging from a fraction of an inch to three inches in diameter, and lays up to 48 conductors at a time in a concentric pattern from as many whirling bobbins.

The machine, built by Douglas Roesch, Inc., of Los Angeles, lays each conductor in position with the proper tension and freedom from twist. The "pitch" of the strands can be varied for more or less flexibility.

Cannon-like Wind Tunnel Creates 18,000-M.P.H. Shock Waves

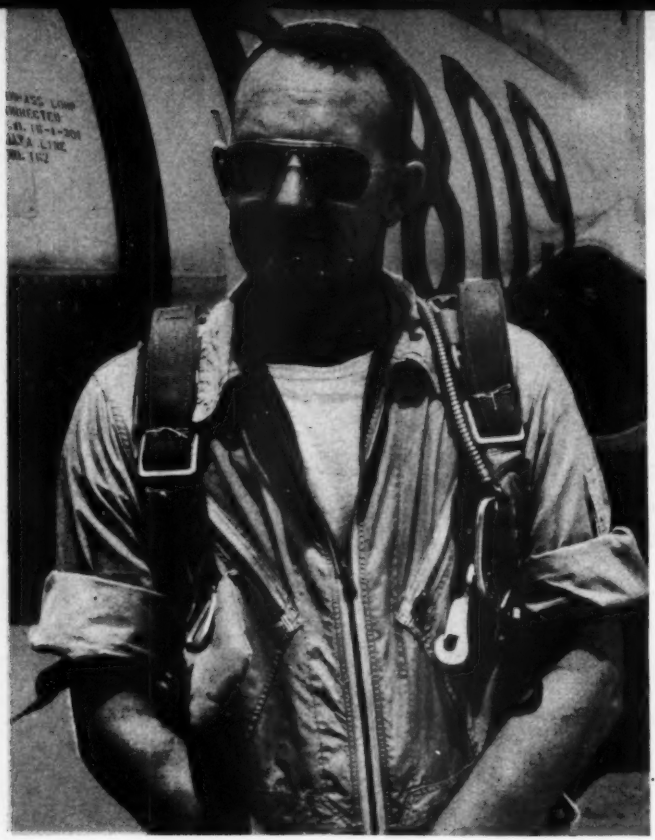
WHEN this 100-foot gun is fired from its control booth (left), a steel diaphragm at the far end (shown being loaded at right) is burst by gas under extreme pressure and sets up a shock wave speeding at 18,000 m.p.h. Avco Mfg. Corp., Everett, Mass., uses it in missile research for the Air Force.

Window Shopper Can Now Buy

LITERAL meaning has been put into the term "window shopping" by an enterprising book-store manager on London's Strand. The customer here makes a purchase right through the show window which has a detachable glass panel.

This Tractor Rides Aboard a Barge to Dredge British Canals

A TRACTOR floated in a shallow barge is being used by British Waterways to dredge its canals. A rear-mounted hydraulic digger on the Ferguson shown here scrapes the bottom and dumps its load into a second barge pulled into position from towpaths. The combination can pass under low and narrow bridges.



The Man

ANTHONY W. LeVIER, director of flying operations, Lockheed Aircraft Corp., was the first man to fly the XF-104. One of the best-known pilots in the U.S., he learned to fly at 15. He has won several celebrated air races, ferried Hudson bombers for the RAF, demonstrated the P-38 here and in England. He was the first man to fly the P-80, the Saturn, the F-90, F-94, Constellation, as well as the new XF-104. He is also the author of an autobiography, called *Pilot.* Tony LeVier is shown at left beside another jet in the ordinary flying suit he prefers to a pressure suit except when called to "wring out" a new plane.

How it feels to fly the World's

Noted test pilot takes you for a ride in the F-104A at more than twice the speed of sound.

By Tony LeVier
AS TOLD TO WESLEY S. GRISWOLD

A LOT of people have already tried to describe the new supersonic F-104A Starfighter. Some call it "a missile with a man in it." Others call it "a flying pencil." Gen. Nathan F. Twining, Air Force chief of staff, says that it is "the fastest and highest-flying fighter anywhere in the sky." Gen. Otto P. Weyland, head of the Tactical Air Command, declares, "No country in the world can match it at this time."

I was the first pilot to fly its prototype, the XF-104, and it's hard for me to find the words to tell you how I feel about this plane. It has the finest touch of any fighter in modern times. I've gone through the sound barrier in it without knowing it—with my hands behind my head, in fact! I've gone supersonic in it *in a climb.* It's so maneuverable that it seems as if you merely had to *think* of turning left or right to have this baby start doing it, and gracefully.

It's capable of darn near flying out of the atmosphere or accelerating till things begin to melt. Yet it's incredibly stable.

A fighter pilot wants his plane to respond briskly to everything he does, without superfluous motions. He doesn't want it to jazz all over the sky in a turn or bob its nose up and down when he

The Plane

A TOP SPEED of 1,500 miles per hour—faster than the sun crosses the sky—is estimated for the missile-like F-104A. Experts reckon that its service ceiling is somewhere between 60,000 and 75,000 feet. The main fuel supply is between the pilot and the engine, which is said to develop a 15,000-lb. thrust. Equipped with additional, underwing pylon tanks, the plane is estimated to have a 2,200-mile range. It can climb like a rocket, reaching the stratosphere in a matter of seconds. For combat it is said to be armed with a very fast-firing cannon, and can carry missiles or an atomic bomb depending on the mission involved.

Fastest Fighter

wants to fly straight. When he's through maneuvering, he wants to level off and stay level. The F-104A behaves just the way he dreams the perfect fighter should behave.

But—climb into the cockpit and try it yourself.

First, you put on a pressure suit. You've seen them. They make you look like Superman and feel as if your whole body were in a tight glove. You strap on your seat pack, which has a survival kit stowed away in its cushion. You put on the pressure helmet, which has an oxygen source in it.

The cockpit canopy is hinged at the left side. The right side is raised for you, like half the hood of an old-time car. A crewman hooks a light ladder onto the rim of the cockpit and you hoist yourself up and into your seat. You fasten your seat belt, shoulder harness and leg straps.

A portable turbine starter is wheeled up to the right side of the plane. It takes so much power to start the J-79 engine that no electric starter made is big enough for the job.

When the starter is twirling the blades of the main turbine at 10 to 15 percent of maximum engine r.p.m., you move the throttle from "Cutoff" to "Idle." The engine starts with a tingling roar that rises quickly to a scream.

You pull down the cockpit cover and latch it, and start running through the check list to make sure you're okay to take off.

You may get a touch of claustro-

NEARLY AS SHARP AS A KNIFE, the leading edge of the F-104A's wing, thinnest of all fighter wings, is only sixteen-thousandths of an inch thick. It is padded to protect ground crews.

phobia at first. But you soon get used to the fact that the cockpit canopy is only a hair above your helmet when you straighten up, and you can't turn your head around as far as usual. Admittedly the seat is not like your favorite living-room chair, but you can raise or lower it four inches and adjust the pedals to the length of your legs.

The F-104A has the simplest cockpit and smallest instrument panel of any modern fighter. The controls are all easy to reach.

When you're ready, you signal the crew, taxi out to the runway and line up. You move the throttle forward to "Afterburner." The thrust is so tremendous that it is all you can do to keep the wheels from skidding.

You release the brakes and start charging down the runway.

How can you see where you're going? Well, the F-104A's cockpit is so far forward and its needle nose slopes so sharply that your visibility is as good as it would be if you rode on the hood of your automobile instead of behind the steering wheel.

I've taken off in jets so many times that if you were to remove every instrument from the cockpit, I could take off okay just by feel. But you'd better take off by the air-speed indicator. Get off the ground at 200 m.p.h. By then you will have covered approximately a mile of the runway.

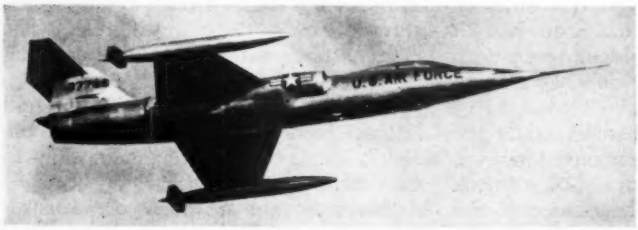
You hear the engine whine as you become airborne, but already its sound seems pretty far behind. You're more conscious of the rush of air into your cooled cockpit from a tiny turbine that maintains the proper pressure for you at any altitude. You sense a tenseness in the plane, rather than hear a loud noise, as its exhaust bellows out the tailpipe with increasing fury.

Suppose you decide to go into a steep climb. In seconds, the needle of the Mach indicator has moved to "1." There is a sudden quietness. You feel no flutter, no tendency of the nose to dip, no urge of the wing to drop to one side or the other. But your altimeter, Mach indicator, air-speed indicator and rate-of-climb indicator all go crazy for a moment, thrown out of kilter by the passage of the bow wave over the Pitot-static tube, in that long boom that projects from the nose. Then they spin to new, true readings.

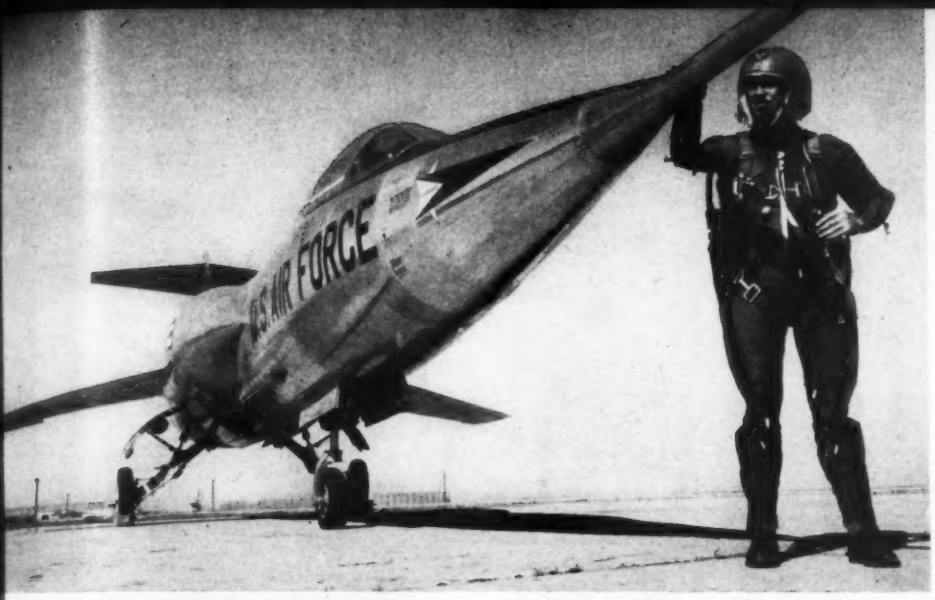
You're through the sound barrier, and still accelerating. You've left all sound far behind, except for the whish of your cockpit pressurizer.

The F-104A performs at its best at ultrasonic speeds, and when it reaches the stratosphere it will climb as fast as it will go in level flight.

All you can see is the deep blue sky. You have to look down to find the horizon. You feel as if you were lying on your back with your feet in the air, as though you were doing a setting-up exercise. Your feet have a natural tendency to fall back toward your face, but you



THOSE STUBBY WINGS are only 7½ feet long, and straight except for a slight downward slant. The plane doesn't need a "Coke bottle" waist because it slides so easily through sonic wall.



UNLIKE MOST FIGHTER PLANES, the F-104A retracts its landing gear into the fuselage. The plane is 54 feet, nine inches long; weighs 15,000 pounds. Intake ports are covered here for security reasons. The man in the pressure suit is "Fish" Salmon, Lockheed's chief test pilot.

don't have to exert much conscious effort to keep them on the pedals.

Had enough? Then ease her over to level flight. The earth now looks just the same as it always does from a plane, but all at once you are aware that places on the map that are long miles apart—places separated by winding roads that you have often driven over—are flashing past in seconds. You get excited just glancing at your instrument readings.

Suppose, at this exhilarating moment, something starts to malfunction. A master warning light flashes on in the center of the instrument panel. But you look to the right, at a little printed panel hardly any bigger than a playing card. It has a series of listings on it, and the one that is illuminated tells you where the trouble is. I'm proud of that system, because I helped develop it.

Let's say it's a temporary malfunction, one that miraculously straightens itself out. I don't want you to have to try out the downward ejection seat on your first flight.

But you're ready to come down anyway? Well, you start descending and decelerating in a great circle whose radius is many miles across. But take it easy. Remember that you can close on the ground at the rate of 100,000 feet a minute in this plane!

You re-enter the traffic pattern of the field at about 350 knots—that's around 400 m.p.h. And continue to ease up on the throttle as you swing around to line up with the runway the tower has told you to use. You nose her down at about the same angle at which you took off—14 or 15 degrees—and touch the edge of the strip at around 175 m.p.h.

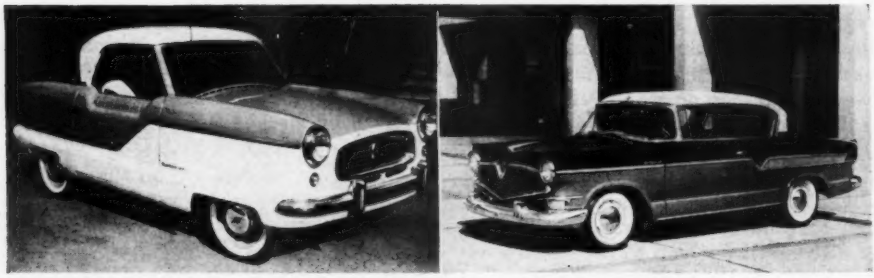
That's twice as fast as an airliner lands, but fighter pilots are used to such speeds. Your F-104A is so small and so stable that crosswinds or turbulent air give it very little trouble. Besides, you know that you have about twice as much runway as the average commercial field provides.

Once your wheels are on the ground, you lower the nose, apply your brakes and reach for a T handle on the dash. Pulling it releases the tail chute. It'll cut your landing roll about in half.

You feel a snubbing effect but no jerk. The chute billows out rather than popping open, and you slow down more smoothly and quietly than an airliner does when it reverses props. END

Panoramic X-Ray Machine Gets Every Tooth with One Shot

A PANORAMIC camera for X-raying all of a person's teeth in one exposure has been developed by the Air Force. A film holder (left) and an X-ray source, on opposite ends of an arm, move in an arc around the head. The film travels in front of the patient, and is exposed when X-rays pass through the back of the head.



American Motors Shows Off Newest of Its High-Fendered Family

THE pint-sized Nash Metropolitan at left, built in England, has an overall length of 149½ inches on an 85-inch wheelbase. The output of its four-cylinder engine has been upped from 40 to 52 hp. The Hollywood hardtop (right) is a Hudson Hornet Special. It packs a 190-hp. V-8 engine (PSM, May, p. 151).

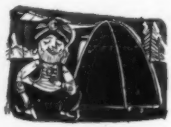
12 New Ways to Camp in Comfort

Vacationing under canvas has long been cheap and attractive—and now it's even growing luxurious. Many new gadgets are adding the comforts of home.

By Frank Rowsome Jr.

THE Indian maharajah lolling atop his princely elephant on a jungle safari has darn few creature comforts that are not available to Joe Doaks on a U.S. camping trip in 1956.

In some ways Joe has the best of it. Where Sir Bangalore has to spend his rupees on cargo and passenger pachyderms plus a few hundred beaters, all Joe has to do is sling his camping gear in the back of the station wagon and head for the woods. And if Joe has some of the ingenious new equipment that has recently been developed, he's going to *feel* like the Maharajah of Doaks.



YOU can get the dangdest gadgets imaginable for comfy camping. There are paper sleeping bags, cozy and warm, that are so cheap you simply toss them in the fire when the trip is over. There is a light, sleep-three-people tent that can be erected in a moment and that looks like an igloo built by a Japanese-lantern designer. There are clever folding cots, artfully insulated so that chilly air can't nip you from underneath. There are axes that turn into shovels, bucksaws that fold to ruler size, shavers that mow down whiskers by clockwork.

A MAN must eat, in the woods especially. The new disposable-tank cookstoves may be less romantic than a wood fire, but they are incomparably quicker and more controllable. A profusion of folding tables and chairs (calculated not to collapse in use) are available, as are ice chests efficient enough to keep ice until long after the drinks run out. There is even an entire collapsible kitchen that glides out the tailgate of a station wagon and is complete to a pump-fed water supply—in case you decide to toss tradition to the winds and wash the frying pan. And if a hunger for broiled meat should assail you, a new charcoal rotisserie uses dry cells and a motor to turn the spit.

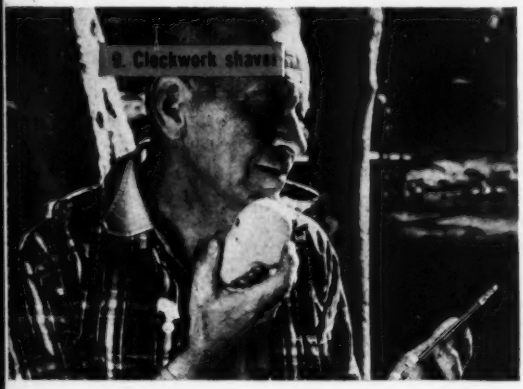
FOR ponds and streams, there's a collapsible boat that a marooned pirate would have given a hundred pieces of eight to have. If you are on the goggles-and-flippers kick, a transparent plastic boat allows you to

1. Pop tent

2. Auto kitchenette

5. Insulated cot

6. Transparent boat


9. Clockwork shaver

10. Paper sleeping bag

watch the fish go by, and conveys the eerie impression of rowing in a soap bubble. If the ducks, fish, or other objective of your boating are guarded by snags and shallows, an air-driven outboard will propel you smoothly past obstacles that would sadly maltreat an ordinary motor.

For dudes and sports? It'd be wrong to surmise that all this new gear is strictly bait for rich sports. Luxurious equipment for these characters has been made for decades, of course, and no amount of

More information *about the products on these pages can be obtained from: 1. Stross Mfg. Co., Box 302, Ann Arbor, Mich.; 2. Camp-N-Wagon, Box 145 E, Pasadena, Calif.; 3. Gibbons Supply Co., Box 226, Birmingham, Mich.; 4. Porta Co., Canton, Mass.; 5. Seattle Quilt Mfg. Co., 308-310 First Ave. South, Seattle 4, Wash.; 6. Goodhue Enterprises, Box 461, Leominster, Mass.;*

invoking the shades of Boone, Crockett, and the mountain men is going to keep them from buying camp shower baths and portable duralumin commodes. But most of the rush of new equipment is aimed at different buyers: the estimated 20,000,000 ordinary folk who will camp out in this country this year.

Woods are full of them. All measurements indicate that people are taking to the woods this year in record numbers. The "camper-day" occupancy curve in

7. Gibbons Supply Co., Box 226, Birmingham, Mich.; 8. J. Chapman & Sons, 440 North Orleans St., Chicago 10; 9. Abercrombie & Fitch, Madison Ave. at 45th St., New York City; 10. Bobwing, 901 South St., Lafayette, Ind.; 11. Airboats, Inc., Box 2255, St. Louis; 12. Seattle Quilt Mfg. Co., 308-310 First Ave. South, Seattle 4, Wash.

national and state parks has been climbing steeply since the war. These places are now receiving the heaviest use in history. Last year the number of campers in government parks was double that of 1950. Makers of camping equipment are in some cases running on extra shifts; a sleeping-bag company is cranking out five times as many bags as it did just three years ago. Right now, at any popular campsite, an observant eye will detect an amazing diversity of people, including many families complete from Gramps to the smallest and dampest infant.

Where they all come from, in such remarkable numbers, is uncertain. Most theories touch on boom times, shorter working hours, longer vacations, more cars and highways, and the comparative economy of camping for family vacations. (A few family-size hotel bills may pay for a camping outfit.) There's an evident relationship or parallelism with the dizzy vogue of station wagons, which have skyrocketed from a fiddling 25,000 a year before the war to 700,000 last year.

That wagons and camping are interrelated is evidenced by the number of products designed specifically for wagon camping. Those in the photos were collected by two Ford publications as part of an ambitious testing project called Recreation Unlimited. Under this program, close to a hundred items have been tried out in actual field use. Several of the new products were developed at the suggestion of the Ford project directors themselves. Besides the tailgate kitchenette, there are a variety of insect screens and mattresses for wagon sleeping. Another product called a "boot" is a special-purpose tent, erected around the opened tailgate, that adds considerably to interior space.

Tailgate kitchenette caters to outdoor-whetted appetites

No Boones about it. With so many new hands trying camping, some woodsy innocence is inevitable. Forest rangers talk about earnest greenhorns, erecting

Lightweight tent "pops" open and looks like a greenish igloo

ONE OF THE NEATEST of the new gadgets is the Pop-tent. To set it up (from left, below) you open the 10½-pound bag, insert six fiber-glass

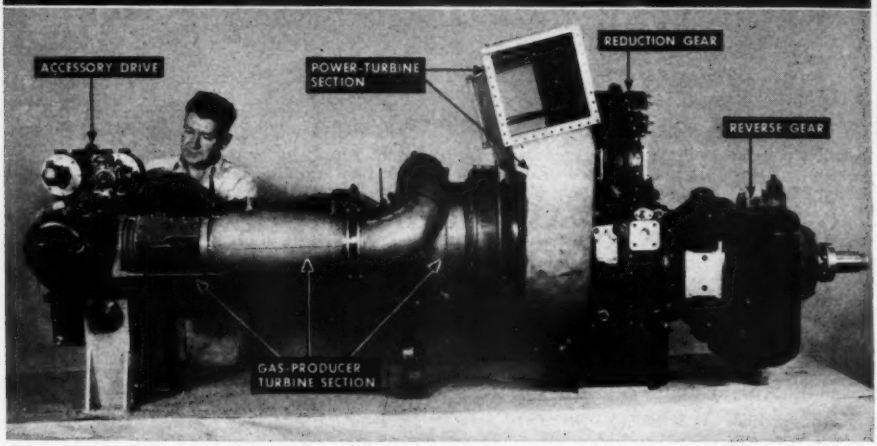
CRANK THE PUMP and out comes cool water for cooking and cleaning up. Recessed drawers beneath and storage compartments behind hold an ample supply of pots, dishes, silverware, and basic food supplies. Folded up and slid forward, the kitchenette leaves stowage area on top.

their elaborate tents for the first time, whose tottery structures collapse at a breath of air. Or about those who slop stove gasoline on the canvas and achieve a burst of incendiary glory, or who mosey dolefully about remote campsites searching for a place in which to plug electric appliances. Some gadgets they carry may evoke a now-I've-seen-everything response, as for example a strap-on set of coat hooks, to be buckled to any tree.

Everybody was a greenhorn once, however, and a great deal of the new gear makes solid good sense. New car-top cargo and boat carriers use chain and turnbuckle tie-downs, eliminating the hallowed ritual of retightening the straps at every gas stop. Cutting a bed of balsam boughs may sound like a fine notion, but air mats are notably easier on both trees and sleepers. And the Pop-tent—the igloo job—is an ingenious and clever shelter, eminently suited to station-wagon camping.

Devices like these are a factor in the current rush to the woods. They help spread the word that camping doesn't *have* to be uncomfortable to be fun. END

ribs in their pockets, and stand the rig upright like a closed beach umbrella. Then you press down on top until the ribs are bowed, tighten a lock wheel on top, and then swing it out to one side. The stressed ribs pop outward, stretching the lightweight canvas until it is taut.



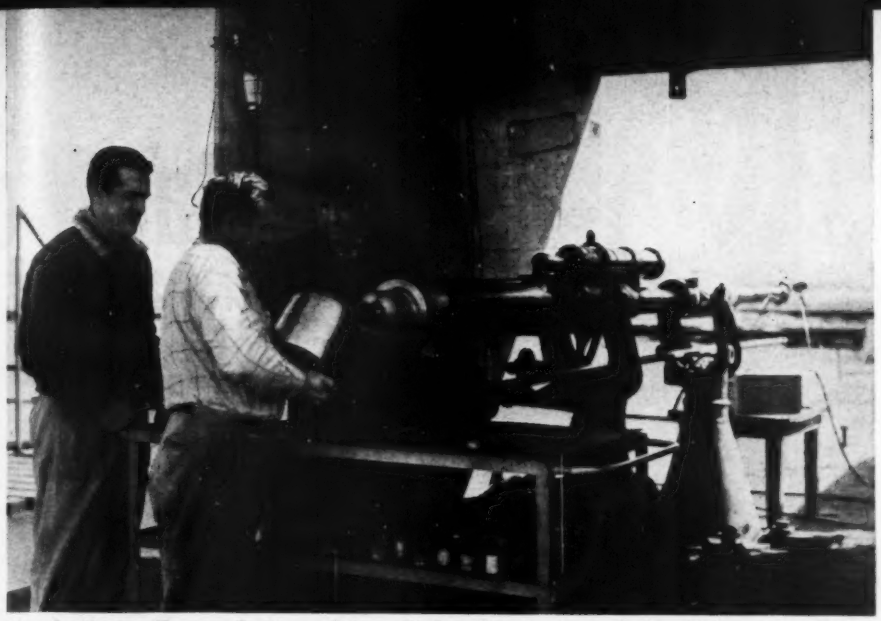
Navy's Powerful Gas Turbine to Double Landing-Craft Speed

THIS 500-hp. gas turbine, a fourth the size of comparable diesels, sent the Navy launch above skimming at 26 knots. Tops with a conventional engine is 12 knots. The exhaust is so hot that it must be cooled by sprays in the ducts. Built by Solar Aircraft of San Diego, the engine is intended to speed amphibious landings.

Magnetic Device Gauges Thickness of Paint Layer

So accurate that it can measure thicknesses one-sixteenth that of an ordinary sheet of paper, the top-like instrument at left is being used to check paint on a turbine wheel. It works on a magnetic principle and can gauge the thickness of glass, paper, plastic sheets or any non-magnetic material placed over iron or steel plate.

General Electric developed it for quality-control checks on such things as car paint, refrigerator enamel and chrome plating on electric toasters.



Navy's 40-mm. "hypervelocity gun" is readied to fire, in tests of ultra-high-speed missiles.

Gun Tests 7,000-M.P.H. Missiles

NYLON spheres as big as golf balls flash past a camera at more than 7,000 miles an hour from a missile-testing gun at the U.S. Naval Ordnance Laboratory in White Oak, Md. Never before have projectiles so large been fired so fast. The trials may help to develop intercontinental missiles and future spaceships that will crack the "heat barrier": destructive heating by air friction at extreme speed.

For a propellant, the gun uses helium gas compressed in a breech chamber and suddenly heated and expanded by steam from burning hydrogen and oxygen. Bursting a blowout disk, the gas blast drives the projectile from the bore, which is exhausted of air before firing to avoid back pressure.

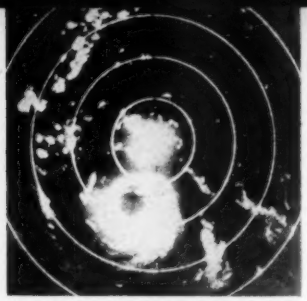
CLOSE-UP VIEW shows a marble-sized nylon sphere being fired at 17 times the speed of sound through rarefied xenon gas, whose low pressure simulates 80,000-foot altitude. Visible ahead of the missile are shock wave (curved dark line) and glowing crescent of ionized gas at a temperature hotter than the sun's surface.

SPEED-CAMERA SEQUENCE studies flight. The gun blast is so hot that it is luminous.

AT 7,840 M.P.H., too fast for the camera to stop it, the round missile looks elongated.

12,200-FRAME-A-SECOND SHOT shows travel of speeding missile against a ruled screen.

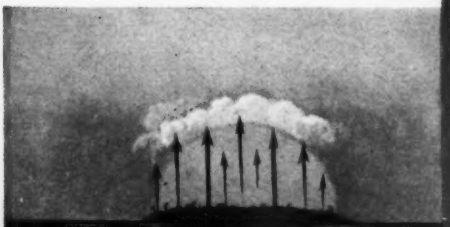
MISSILE HAS SPED five feet in final photo. This projectile was size of a golf ball.



How a hurricane looks on radar.

Can We

Weathermen expect to try



A hurricane starts small as a rising column of warm air heated by the tropical sun

If the rising air mass becomes very large, rotation of the earth makes it spin like a top, generating violent winds that whirl counterclockwise in the northern hemisphere. Such a tropical cyclone becomes a hurricane when its winds top 75 m.p.h.

Normal development of hurricane, shown in paintings above, may be unbalanced by effects

By Ernst Behrendt

THE U.S. Weather Bureau is going to *do* something about hurricanes this year. Its scientists will try to learn how to steer one.

If their experiments work, full-scale hurricane control may follow, although it would take years to perfect. The vicious tropical storms could then be guided away from land to blow out their gales and dump their floods over empty ocean. Disasters like last fall's Connie and Diane would become as much terrors of the past as the Black Plague.

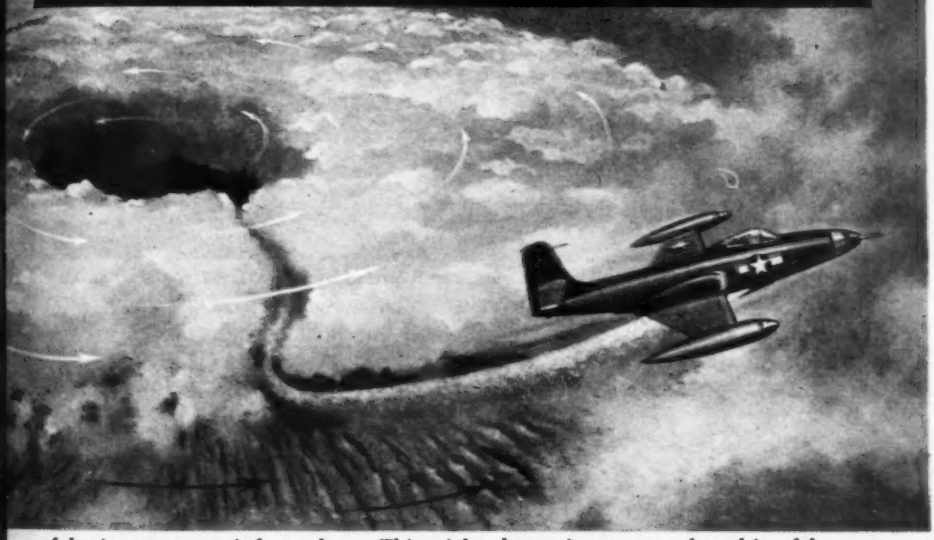
The weathermen hope to change slightly the course of a hurricane by seeding it—scattering pellets of dry ice into its clouds. This may release energy from the storm, unbalancing it and changing its course. They will work on a hurricane far away from land, because no one knows for sure what seeding will do. Actually, the Weather Bureau is still skeptical that seeding will do anything, good or bad. But as one specialist puts it, "Hurricane control is such an important subject that we cannot afford to overlook any possibilities."

The seeding trial is only part of the

Steer Hurricanes Away?

just that this summer, by seeding a storm with dry ice.

A full-grown hurricane may stretch across 500 miles and reach 12 miles into the sky. The central eye—usually about 14 miles in diameter—is calm, but just outside it winds can hit 150 miles an hour. Besides flooding rain and high winds, the storm causes great ocean swells that travel far ahead of the hurricane and often raise the sea level 15 feet



of dry ice strewn on it from planes. This might change its course and send it safely out to sea.

National Hurricane Research Project, an all-out search for the causes and cures of hurricanes. Beginning this spring, teams of government and university scientists headed by Robert H. Simpson, Director of the Project, will probe, test and measure the lethal storms roaring up from the Caribbean. They will use every tool and technique in the book:

- Rockets will carry cameras 100 miles above the earth to snap pictures of an entire hurricane.
- Airplanes—two B-50s and a B-47—loaded with new instruments will patrol the seas where hurricanes breed.
- A hurricane beacon—a radio-carrying balloon set to fly at a constant altitude—may be placed in the eye of a storm so that ground observers can follow its radio signals and track the storm.
- Electronic brains will try new forecasting methods, using daily reports from 28 weather stations, U.S. and foreign.
- Special studies of many hurricane characteristics will be made. These include investigation of the hurricane surge, the sudden rise in ocean level that floods low-lying areas and causes most hurricane deaths. Also under way is a detailed study of sea surface tempera-

Jets like this Banshee, shown over 1955's Connie, will probe hurricanes for research project.

tures, which may forewarn of hurricanes.

The attempt to steer a hurricane by seeding depends greatly on the wide-ranging research of the entire Project. Seeding will be tried only if the preliminary studies indicate that it may succeed.

PIONEER SEEDERS, Drs. Irving Langmuir, Vincent J. Schaefer and Bernard Vonnegut, use a kitchen freezer to show how dry-ice pellets can change a cloud of moisture into snow crystals.

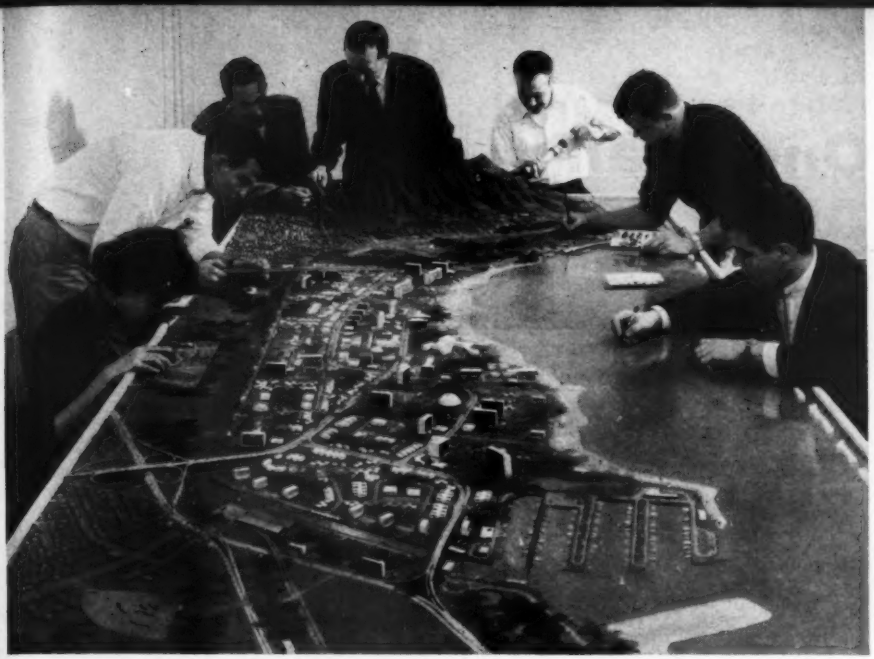
How seeding works. Dr. Irving Langmuir, Nobel-Prize-winning scientist who pioneered cloud-seeding, compares it to setting a match to a haystack. You touch one corner, and fire spreads to the whole stack. In a haystack, the heat of one burning blade of hay sets fire to the next.

Cloud seeding, Dr. Langmuir explains, causes a similar release of pent-up energy. It serves as a trigger. But the process is a bit more complicated.

First, you sprinkle cherry-sized pellets of dry ice on a cloud—it must be a super-cooled cloud, its temperature below freezing. The dry ice immediately produces tiny ice crystals. Each crystal becomes a nucleus around which more moisture from the cloud freezes. This forms snowflakes of rapidly increasing size, which fall through the cloud. When the snowflakes reach warmer altitudes they melt into rain.

"Dry ice is like the germ of a disease

[*Continued on page 224*]

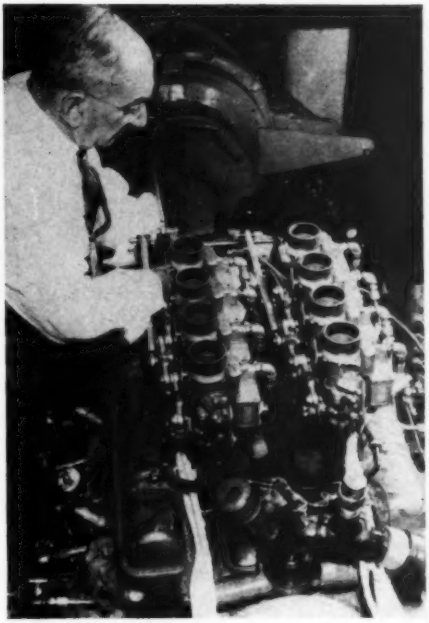


Plan Would Remodel Waikiki Beach for Bigger Tourist Trade

THE model above is Waikiki Beach, redesigned by students at Cornell's College of Architecture to accommodate more than twice as many tourists and still retain its atmosphere. It is being sent to Hawaii where a 10-year plan to increase visitors from 100,000 to 280,000 a year threatens congestion of this area.

Football Takes to Great Indoors

So THE Buckeyes' practice can't be held up by rain, sleet or snow, Ohio State is building this indoor football field. It has a clear span of 200 feet.



Auto Engine Has Eight "Pots"

THE special engine at right is fitted with eight carburetors. It permits Esso researchers to test and compare eight experimental gasolines at one time.

One-Man Observatory Spies on Pheasants

PHEASANT OBSERVER Francis Kessler uses anemometer to measure wind velocity within a few inches of ground, in study of "microclimate" around a nest. Fenced-in, five-acre plot near Delaware, Ohio, is the site of his observatory.

IT'S a small world, with a climate all its own, deep in tall grass where a hen pheasant hatches her eggs. And no one but a pheasant knew much about it until Francis Kessler, Ohio State University graduate student, set up a miniature observatory for the Ohio Wildlife Research Unit. Now he's recording how well the eggs are tended, their individual temperatures, and the "microclimate" near the hen's nest.

Better hunting and fishing is the aim of some 200 such fact-finding studies in progress at 17 wildlife research stations from Alabama to Alaska. Kessler's findings, for example, will tell conservation officials what types of food and cover plantings are best for nesting pheasants. And game-bird breeders will learn which nesting habits of hybrid pheasant strains promise the biggest hatches of young birds.—*George Laycock.*

MOTION STUDY tells when hen pheasant shifts position on eggs, leaves nest, returns. Bird's weight, on wire through nest behind stake, trips microswitch in this box. Usually bird is away from nest 45 minutes daily, the device shows.

TEMPERATURE near ground is recorded by thermograph that Kessler is preparing for use. He gauges rainfall, too. His instruments' data will show how weather conditions near a nest affect a bird's success in hatching her eggs.

RECORDING CENTER of Kessler's observatory registers egg temperature on moving chart in commercial-model recorder at left. He's adjusting a device of his design to clock pheasants' movements. Paper sheets keep 24-hour records.

PHEASANT EGG has its own temperature measured by thermocouple attached with plastic cement. Kessler finds some hen pheasants do better than others in keeping their eggs covered, indicating a trait to be sought by game-bird breeders.

Want to buy a Ford at 86 horsepower?

Fanciest British Ford is two-tone Zodiac.

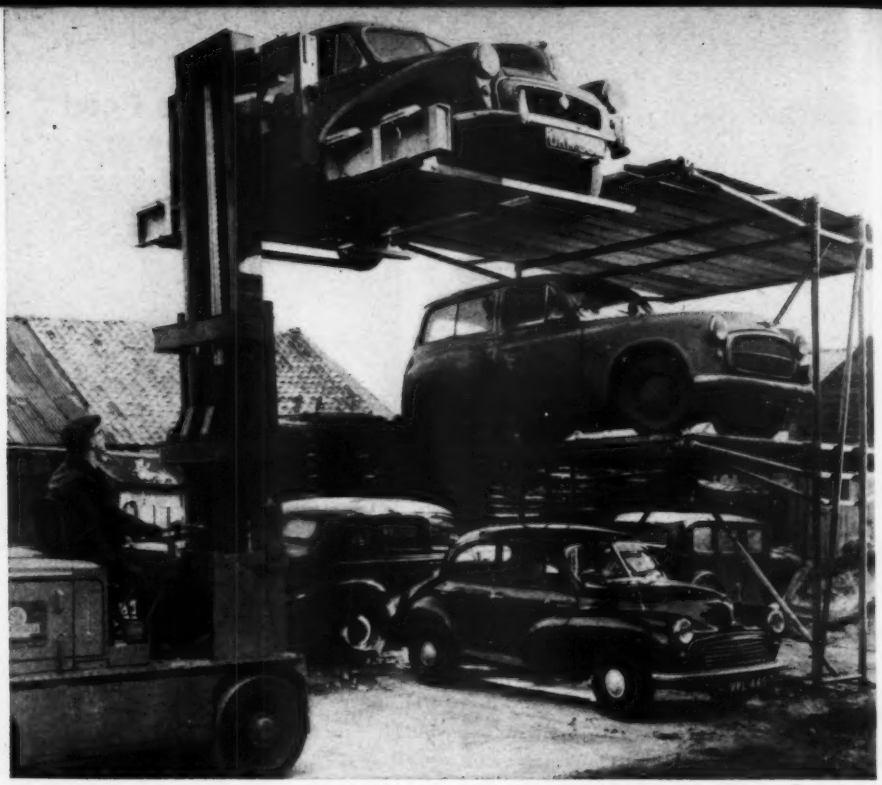
FORD cars of 59 to 86 horsepower were put on sale all over the U.S. last month. They are really Fords—the genuine article. They really have only a bit more horsepower than the Model A Ford boasted of 25 years ago.

These Fords aren't home-grown. The home-grown ones start at 137 horsepower and streak on up. The Fords of timid horsepowers are built by Ford Motor Co., Ltd. of England.

The British-built Fords introduced last month come in three versions. The Consul, at 59, is the lowest in horsepower. The Zephyr and Zodiac, at 86, are top hole, old boy!

Styling of the Zodiac, pictured here, shows its kinship to Detroit. It even has the new crushable steering wheel to ease the impact on the driver in case of a crash.

It seats six, has a 20-cubic-foot trunk.



Fork-Lift Truck Stacks Cars to Multiply Parking Space

ONE way to conserve parking space is by this method which is being tried out in a British parking lot. A fork-lift truck parks and unparks each car on prefabricated racks. Its forks adjust for different-size autos. The system was invented by Clifford Fitch, Wire Products and Machine Design, Ltd., Sideup, Kent.

Automatic Seat Moves Six Ways

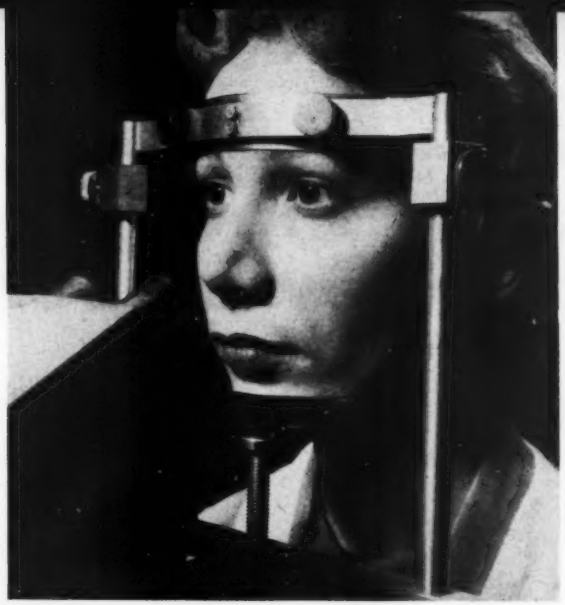
OPEN either door of this Oldsmobile Starfire convertible and the seat moves back to let you get in. Fold the back down, and the seat moves forward for rear passengers. The new power seat also has up, down and two tilt positions.

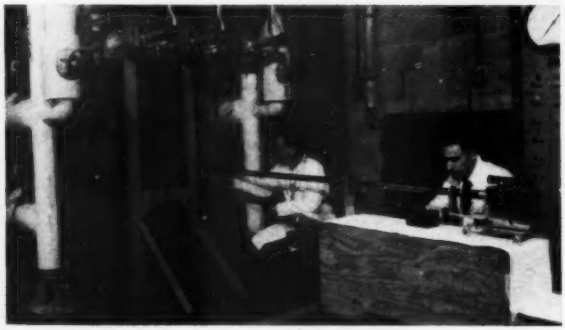
Three-Cylinder Auto Hits 70

THIS new Swedish Saab "93" packs a three-cylinder, two-stroke engine that gives it a top road speed of around 70 m.p.h. With its 46-cubic-inch piston displacement, it develops 37.5 hp. The car will sell in the U. S. for under $2,000.

Camera Tests Eye Appeal of New Package Designs

TAKING a cue from photographers who used to clamp your head in a vise to keep it still, modern package designers made this harness to help them test the eye appeal of new packages. A camera (left foreground) is focused on a subject's eyes to record their movements and thus rate her interest in packages on shelves within her view. It's a research project conducted by the Folding Paper Box Association.



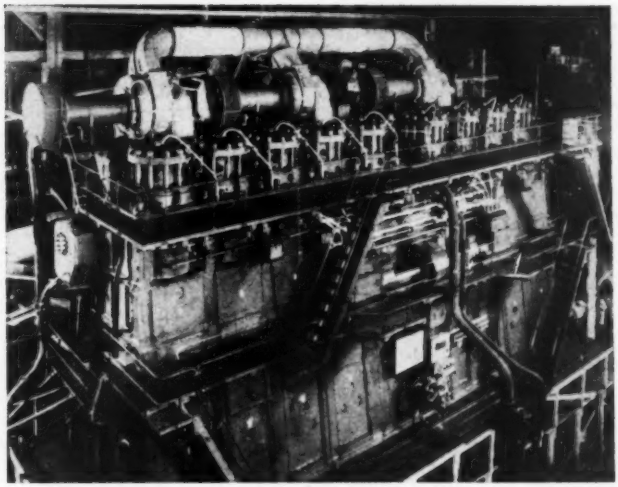


Mobile Lens Takes A "Travel Movie" Inside Reactor Pipes

THE long lens mount on the movie camera at left gives engineers a view of the inside of reactor tubes as they check for damage at the Hanford atomic plant. Its 120-degree lens, moving inside a tube, puts the pipe interior on film.

Nine-Cylinder Diesel Yields Record Power

BELIEVED to be the largest marine diesel engine ever built, this giant power plant has a maximum rating of 13,200 hp. Recently completed, it has been installed in the Japanese cargo boat *Sado Maru*. The nine-cylinder whopper is said to develop the greatest total and per-cylinder output of any diesel in the world.



New in Aviation

Jets Shoot for New Records

Deadliest of the aircraft in the news this month is the Snark (at left), first U. S. guided missile with enough range to cross oceans. Developed by Northrop Aircraft, it can tote an atomic warhead. Guided by radio from Patrick Air Force Base—the site to be used in launching our artificial earth satellites—it has winged 2,000 miles.

Biggest plane is on the drawing board and would be driven by atomic power. Its dreamer-upper, Lee Ohlinger of Northrop, says it could fly almost indefinitely. As a Leviathan bomber, it would tow a flock of fighters until danger developed, then cut them loose. As a commercial "locomotive," it would tow airliners on airlanes all over the world.

Plushiest is a four-jet airliner (at right) just announced by Convair. It will cruise at 609 miles an hour in vibrationless luxury. As a first-class plane, it will seat 80 passengers; as a low-fare tourist plane, 99.

Sauciest plane is a twin-jet Russian Tupolev Tu-104 that flew into London Airport, startling observers this side of the iron curtain. It seats 50 passengers and probably can fly more than 500 miles an hour. Weighing about 75 tons fully loaded, it's about the size of Britain's Comet III.

Experts say that the plane is adapted from the Reds' Badger bomber.

Fastest timed mile ever flown is claimed by Britain for this Fairey Delta 2, which was clocked officially at 1,132 m.p.h. in level flight. U. S. F-104A (see page 74) is reported, unofficially, to be even faster.

For more picture news in aviation, please turn the page

New in Aviation

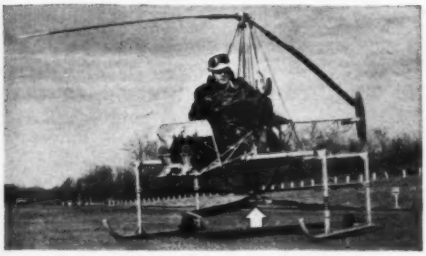
A Falcon missile in firing position...

...An instant later it is launched

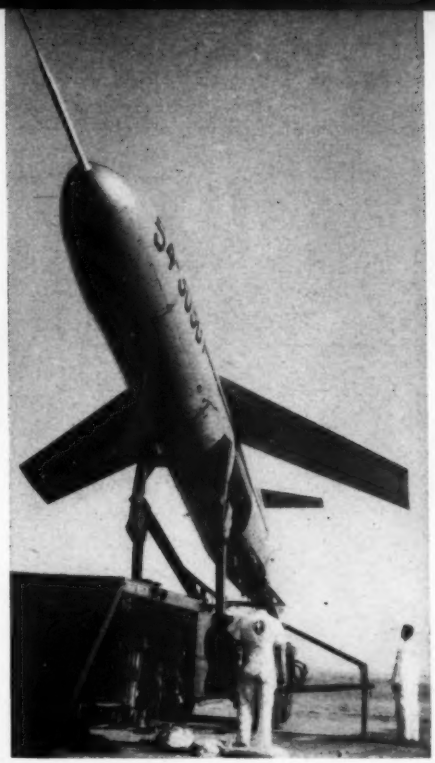
Airborne Missile A new sting has been added to the Air Force's F-89H Scorpion all-weather jet interceptor. It now carries Hughes Falcon guided missiles in wing-tip pods. For launching they are extended from the sides (top photo). The F-89H is the first operational fighter to pack this punch.

Tail Test This looks like an accident, but was an experiment—to see whether an Air Force C-130 could withstand repeated pressurizing at high altitudes. The tail section was purposely submerged in a 600,000-gallon pool at the Lockheed plant at Marietta, Ga. Those things on the tail are tension pads to measure strain.

Mobile Shower This trailer-mounted unit provides quick, on-the-spot decontamination for crews exposed to dangerous chemicals while firing rockets or launching guided missiles.



Belly Rotor (arrow) on new kind of helicopter designed by Bruno Nagler of White Plains, N. Y., whirls opposite to main rotor overhead, eliminating torque and the tail rotor.



New Matador A bigger warhead nose and greater length distinguish this TM-61B Martin tactical missile from its predecessor the TM-61, which is now on alert status with the Air Force in Europe. An entirely new electronic airborne guidance system has been developed for the projectile.

Copter Drinks And now the whirlybirds have taken up in-flight refueling. It will enable them to fly farther and carry heavier loads. The Marine Corps helicopter at far left, converted into an aerial tanker, is transferring fuel to a thirsty brother during a demonstration at Quantico, Va. The system used is the probe-and-drogue, which the Navy has found most efficient for mid-air refueling of carrier-based jet aircraft.

Tiny Rooms Show U. S. History

A museum's inches-high pageant of interior design grew out of a girl's miniature dream world.

By George H. Waltz Jr.; photos by Hubert Luckett

THANKS to a little girl's love of dolls more than half a century ago, visitors to Chicago's Art Institute are now marveling at an amazing collection of miniature rooms. Precisely built to the Lilliputian scale of one inch to a foot, these tiny reproductions present a vivid three-dimensional history of the way that people have lived since the Renaissance.

The rooms into which you can peer range from a 13th-century French salon to an ultramodern room in a San Francisco apartment. Seven of the American rooms are shown in full-color photos—for the first time in any national magazine—on the next four pages.

What is the purpose of this unique Thorne exhibit? What can the visitor learn from these miniature rooms? The Art Institute's Curator of Decorative Arts, Meyric R. Rogers, recently explained:

"Picture yourself in a museum of interior design consisting of 67 completely furnished rooms covering the main periods of European and American design. The mind's eye immediately visualizes a monumental building that would require a visitor to walk miles to see all of the exhibits.

"These rooms give us the essentials of all that in the space of one moderate-size gallery, with every exhibit at eye height. Because a visitor can study and compare the most significant and characteristic examples of the various styles of decoration and furnishings right in one spot, the rooms offer an extraordinary means of vivid visual education in the elements of interior design."

How did it happen that such a costly set of exhibits was built?

Some 60 years ago a little girl in Vincennes, Ind., liked to play with dolls, dollhouses and doll furniture. Unlike most little girls, however, Narcissa Niblack paid more attention to the houses and the furniture than she did to her

[*Continued on page 218*]

Virginia **MINUTELY CARVED** walnut paneling in this entrance hall is an exact copy of that in Carter's Grove, a fine 18th-century plantation house in James County, Va. The door in picture at top right faces the paneled walls and a graceful archway over the broad stairway and hall. The clock actually keeps time.

For more pictures of the Thorne rooms, turn to pages 100-102

Tiny Scale

ENTRANCE HALL above is a reproduction of the one in the famous Peirce Mansion, Portsmouth, N.H., built in 1799. Diminutive size of the Thorne rooms can be appreciated in this picture, which shows the hall getting a "housecleaning" with a small brush. The door in the picture at right leads into the Carter's Grove house, shown below.

New England

TYPICAL 1840 BEDROOM. One interesting feature in this reproduction is the wall decoration—designs stenciled right on the bare plaster walls. This was an accepted form of decoration in the

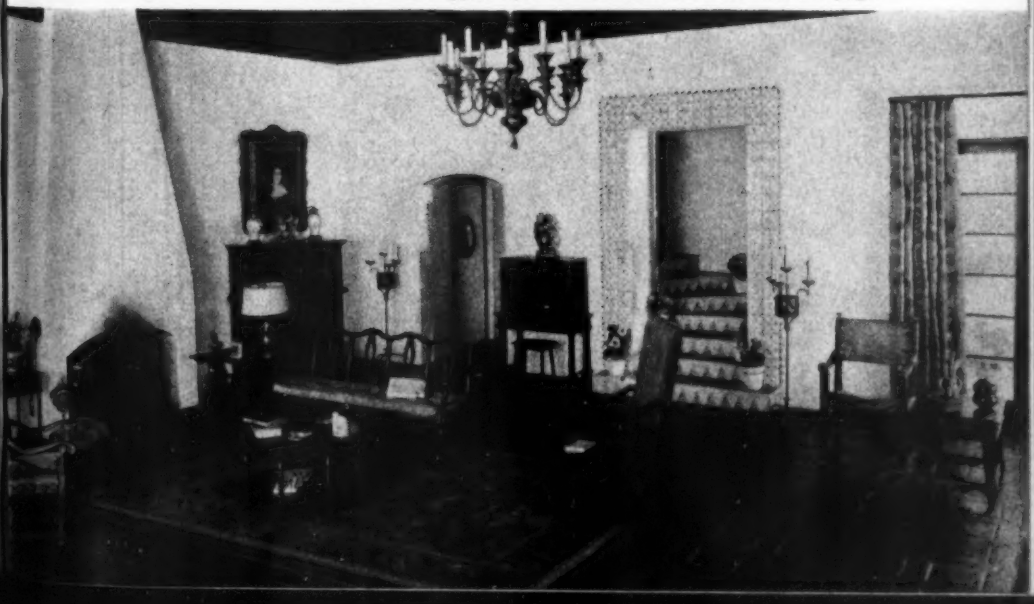
South Carolina

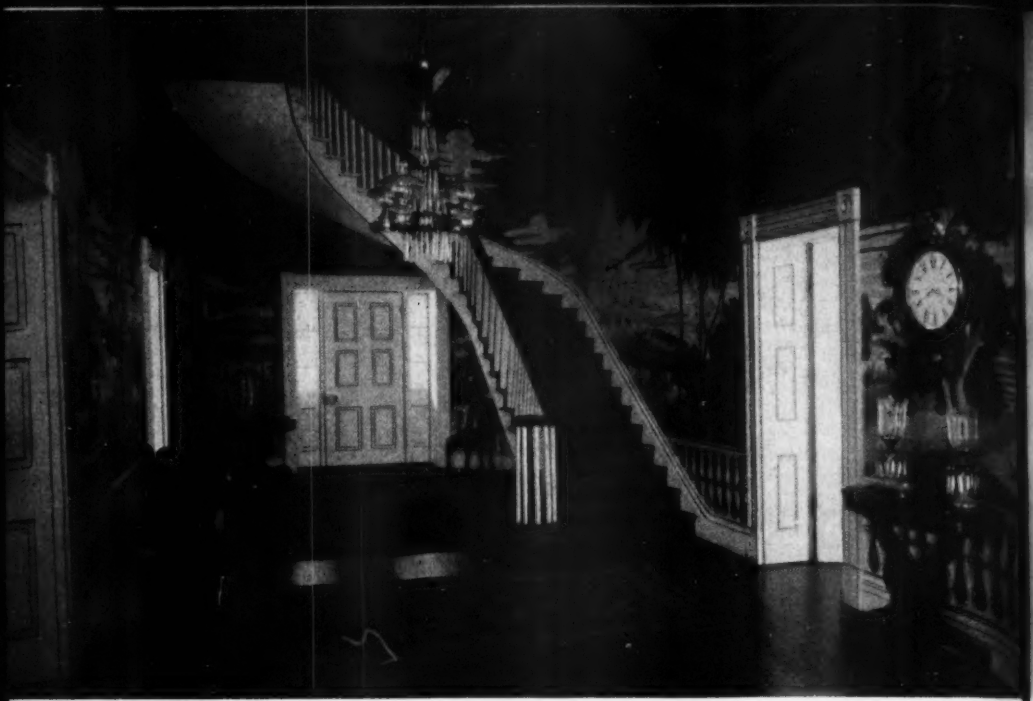
CHARLESTON DRAWING ROOM. This model is based on a house built by Col. John Stuart in 1772. The room is furnished with both Sheraton and Hepplewhite pieces. Rugs and screen are Chinese.

days when wallpaper and paneling were too expensive for the average man. The housewife patiently cut out a stencil for a design that she liked, and the husband did the stenciling. Note the fireplace, the wide, random-width floorboards, and the washstand with its pitcher and bowl.

California

SPANISH INFLUENCE is seen in this reproduction of a living room in the home of George Washington Smith, noted Santa Barbara architect. White walls and architecture suggest style of the missions. *Please turn the page.*



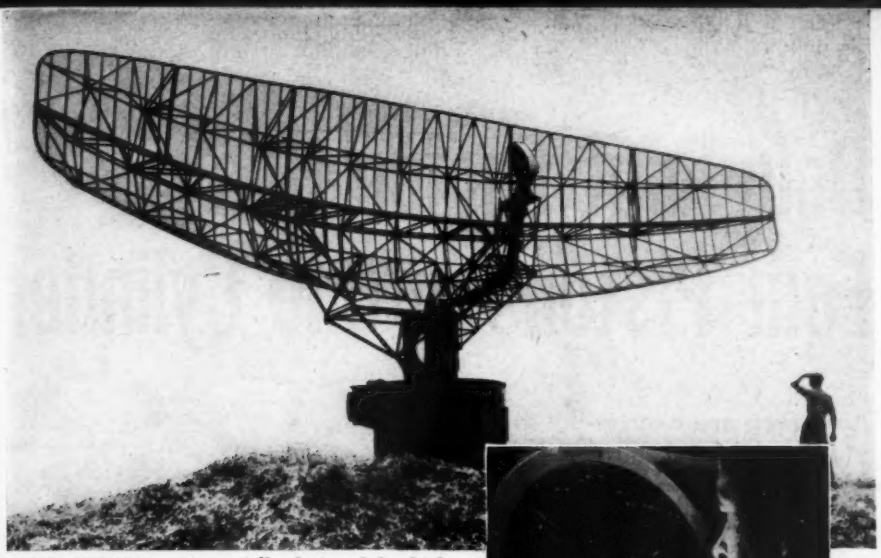


Tennessee

ANDREW JACKSON'S HOME near Nashville, the Hermitage, boasts this gracefully curving stairway. The door at the near left leads into the room that served as Old Hickory's combination office, study and library.

New York

PLAIN LIVING ROOM is typical of the living quarters in the homes that deeply religious "Shakers" built about 1800 in New York, Ohio, Pennsylvania, Kentucky and Indiana. Note the twin chairs and chest-desk.



GIANT ANTENNA was specially designed for high-altitude, long-range radar tracking of planes.

ELECTRONIC MAP can be superimposed on the radarscope, as above, so that the operator can always pinpoint an airplane's exact geographical location.

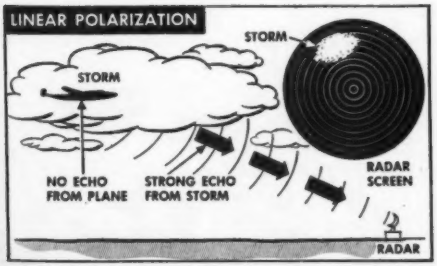
Long-Range Radar Will Direct Air Traffic in Canada

ANTICIPATING a vast increase in air travel and the coming of high-speed commercial jet airliners, Canada is spanning the continent with radar. From Moncton, New Brunswick, in the east, to Vancouver, British Columbia, in the west, 15 long-range surveillance installations will be located at major airports.

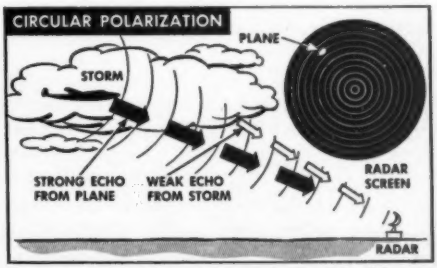
Huge antennas, measuring 40 feet across, will scan the skies. These electronic watchmen will be able to "see" large airliners 200 miles out and 70,000 feet up. Their main job will be to prevent traffic jams, or stacking, over major air terminals in a 400,000-square-mile area, especially in bad weather.

Delivery of the radar units, being built by the Raytheon Manufacturing Co. at a cost of more than $5,000,000, will begin early in 1958.

The U. S. Civil Aeronautics Administration is experimenting with similar equipment, on loan from the military, at Norfolk, Va., Chicago, and New York.



ORDINARY RADAR bounces back signals from both plane and cloud. Cloud signals, however, are so strong that they blot out the plane image.



NEW RADAR, by changing polarization of beam, filters out echoes from the cloud so that only the plane's image reaches the radarscope.

Doughnut Engine Has Four Pistons in One Cylinder

Auto men are excited by the promise of this compact power pack invented by a famous British engine designer.

Granville Bradshaw

A GASOLINE engine not much bigger than the ones that power many home lawn mowers may actually develop 120 horsepower.

That's what a respected British inventor, Granville Bradshaw, says his latest engine design will yield. It is a one-cylinder, four-piston job that contains only nine moving parts. Bradshaw believes that this mighty mite, which he calls the "Omega," will make the present internal-combustion engine designs virtually obsolete within a very few years.

Automobile manufacturers, both abroad and in this country, are bending interested ears. They remember that Granville Bradshaw designed Pratt & Whitney's first radial aircraft engine, during World War I.

Since then, he has pioneered in developing flat-twin motorcycle engines, motor scooters and oil-cooled engines.

Now, at the age of 67, the millionaire inventor says slyly: "If Detroit's horsepower race ever reaches the point where somebody wants to put a 3,000-horsepower engine under the bonnet [hood], he can do it quite easily with a king-size Omega engine."

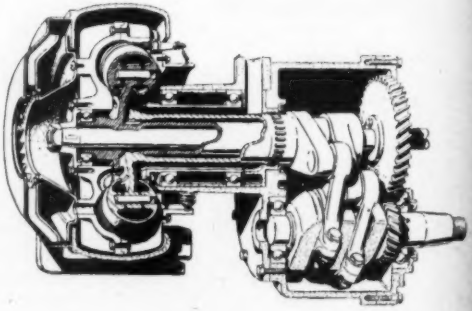
The new engine is revolutionary in action as well as conception. Shaped like a doughnut, it has a single, circular cylinder that rotates continuously around four double-faced, curved pistons. These reciprocate in pairs, transmitting a scissors-like action to a pair of rocker arms that pump connecting rods up and down to rotate the engine's crankshaft.

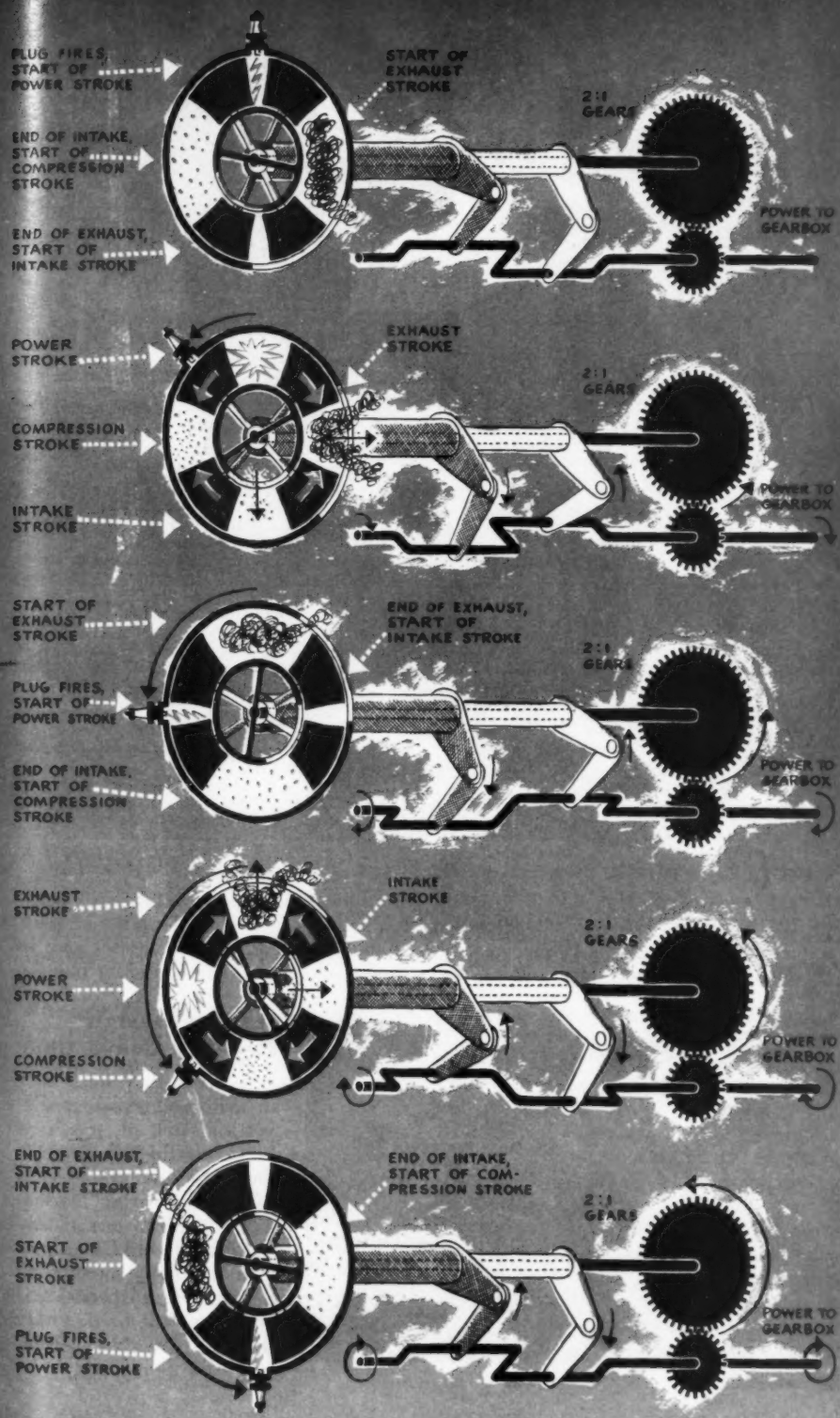
This ingenious drive eliminates both inertia losses caused by crankshaft reversals, and the big load on reciprocating parts and their bearings.

In a conventional car engine, the alternating loads on the big end of a connecting rod may be around two tons after every crankshaft reversal.

[*Continued on page 252*]

THE OSCILLATING ACTION of two rocker arms rotates the crankshaft of the doughnut engine. The gears turn the cylinder over once while the crankshaft completes two revolutions.




PLUG FIRES, START OF POWER STROKE
END OF INTAKE, START OF COMPRESSION STROKE
END OF EXHAUST, START OF INTAKE STROKE
START OF EXHAUST STROKE
2:1 GEARS
POWER TO GEARBOX
POWER STROKE
COMPRESSION STROKE
INTAKE STROKE
EXHAUST STROKE
2:1 GEARS
POWER TO GEARBOX
START OF EXHAUST STROKE
PLUG FIRES, START OF POWER STROKE
END OF INTAKE, START OF COMPRESSION STROKE
END OF EXHAUST, START OF INTAKE STROKE
2:1 GEARS
POWER TO GEARBOX
EXHAUST STROKE
POWER STROKE
COMPRESSION STROKE
INTAKE STROKE
2:1 GEARS
POWER TO GEARBOX
END OF EXHAUST, START OF INTAKE STROKE
START OF EXHAUST STROKE
PLUG FIRES, START OF POWER STROKE
END OF INTAKE, START OF COM-PRESSION STROKE
2:1 GEARS
POWER TO GEARBOX

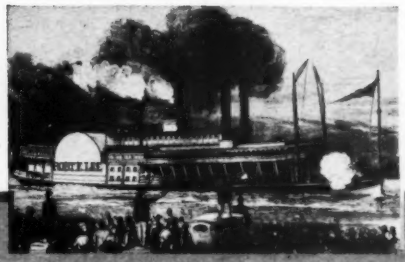
Electricity Shifts the Gears on Push-Button Motorcycle

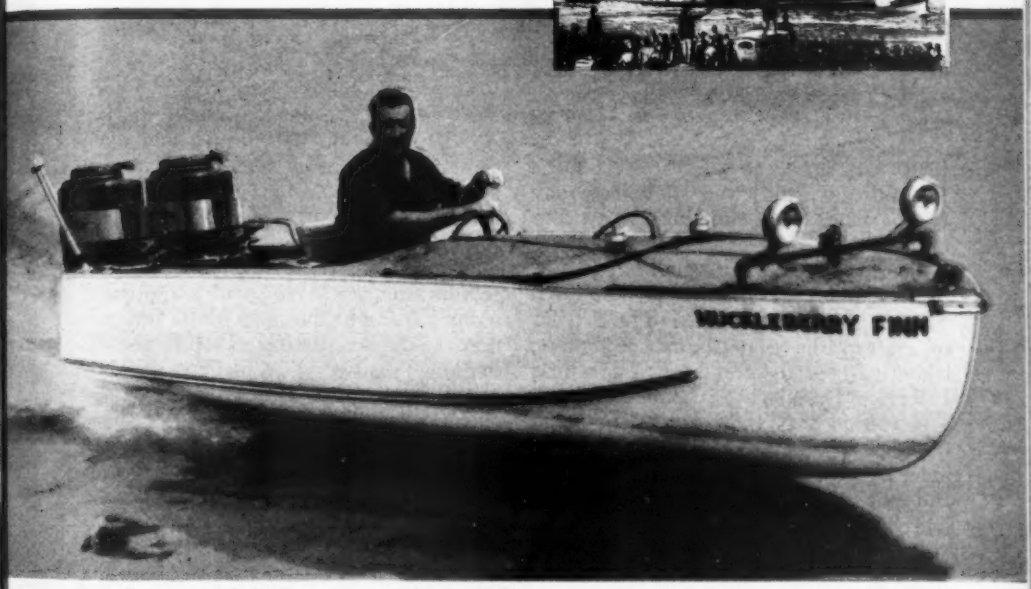
PUSH BUTTONS on the handle bars of this West German motorcycle make shifting a one-hand operation. While working the clutch of the low-slung Victoria, the rider presses one of four buttons (inset) with his thumb. This energizes an electromagnetic coil which meshes one of four gears. Button on side is for neutral.

Italians Design Roll-Top Convertible

A ROOF that rolls back in its frame makes a convertible out of this new version of the tiny Fiat 600. Designed along the same lines as an earlier hardtop model, the little gas-stretching Italian auto has a four-cylinder engine mounted in the rear, four speeds, and four-wheel hydraulic brakes. It will seat four.

Daredevil Boatmen Challenge Ghost Ship





Lee Sawyer, with 57-hour run, single-handedly topped feat of the Robert E. Lee (old print).

Racers try to beat the Robert E. Lee's historic 90-hour run from New Orleans to St. Louis.

By Robert Lasch

WHEN the moon shines bright on the Mississippi River this summer, idlers on the shore will see ambitious boatmen racing against the ghost of the steamboat *Robert E. Lee.*

In the dying days of the river's glory, back in 1870, the sidewheeler *Robert E. Lee* raced the *Natchez* from New Orleans to St. Louis. Some 200,000 cheering citizens were on the levee at St. Louis when the *Lee* docked, winner of the river race of the century with a record time for the 1,250-mile run of three days, 18 hours and 30 minutes.

Not long after its great victory, the *Robert E. Lee* burned afloat with a loss of 30 lives, and the river went into a long decline as railroads took over the valley's transportation. Then in this century the river slowly began to come back.

Army Engineers built dams, locks, dikes and a channel. Ponderous barge tows plied the winding course with cargoes of wheat, coal, lumber, automo-

Present Champs of New Orleans-St. Louis speed run are Raymond Loetscher (left, with wife) and Charles Loetscher (right, with wife). The Loetscher brothers and navigator Max Zeiner (rear) set 53-hour mark last August.

biles and even, nowadays, jet planes. Up and down the river, sportsmen took to the water with outboards and cabin cruisers.

So today, when the moon is full and the stage not too high, some daredevil boatman is as likely as not to be driving his craft up the roiling Father of Waters, trying to beat the *Robert E. Lee's* time from New Orleans to St. Louis.

Tradition says that more than 1,000 boatmen have made the try since 1870, most of them during the last 25 years. But only six have both completed the journey and beaten the *Lee's* time.

The river is shorter now, by 200 miles. Its channel is marked. There are drop boxes along the bank where a boatman can pick up Government information on channel and weather. The Coast Guard and Army Engineers patrol the river. At many towns there are boat (or "yacht") clubs, composed of enthusiastic rivermen who are more than glad to help a racing challenger refuel and tune up his motor.

But the Mississippi still finds ways of spoiling the dreams of those who set out on the grueling course.

A heavy rain and a sudden rise can send a flood of driftwood and debris downriver to foul propellers and shatter hulls. An overnight shift in the channel can maroon the boatman on a sand bar, his motor disabled and his spirit broken.

Many a racer has hit a floating log and come to with his mouth full of muddy water while his boat roared in aimless circles around him.

The big diesel-powered tows set up washes that compel small craft to creep as no racer can afford to do. At some spots on the river in July and August one of the greatest hazards is bugs—buzzing clouds of them, pelting the pilot's eyes, ears and hair, driving him half insane and even sometimes confusing him into going up some dead-end bayou instead of continuing on the main channel.

Then there is fatigue—the massive, deadening, overpowering weariness that sets in after you have spent a night and a day looking at the same bluffs and cottonwood banks, veering off sand bars and dodging driftwood, replacing sheared propeller pins, refueling at lonely docks, cleaning the motors and putting them back together again, and fighting the relentless current that is always trying to take you back to New Orleans.

This is why only six out of a thousand have beaten the odds. And maybe it's why, each year, boatmen from Missouri, Illinois, Arkansas and points south keep

First in 22 Years to better early contenders' marks, Roy F. Smith (left) and a co-pilot won short-lived championship with their 79-hour upstream run in 1953.

trying to get into the small circle of those who have tried and won.

The first man to beat the *Robert E. Lee's* record was a Memphis doctor named Louis LeRoy. In 1929, aided by a crew of three, he piloted his 26-foot inboard *Bogie* over the historic course in three days, 15 hours and 31 minutes. He beat the *Lee's* time by three hours, and averaged 12 miles an hour.

Koenig Cup Donor, Commodore Edwin C. Koenig (center), congratulates Frank G. Burkarth (left) and his pilot on 61-hour run in '53. Along shortened river, they were the first to beat the *Lee's* average of 14 miles per hour.

Dr. LeRoy was the first winner of the Koenig Cup, which is one of the incentives for the Mississippi race. The cup, a towering silver trophy suitable to the majesty of the occasion, was donated by a retired St. Louis businessman, Edwin C. Koenig, commodore of the St. Louis Yacht Club. He wanted to see somebody beat the *Robert E. Lee,* and was generally willing to write a check to go with temporary possession of the cup.

Two St. Louisans, G. F. Schokmiller and George Blaich Jr., took the cup away from Dr. LeRoy by trimming eight hours off his record in 1931. And then for 22 years nobody succeeded in bettering their time.

One of the more spectacular attempts was made in 1952 by Lee Sawyer, a St. Louis electrical contractor who got started in this game through duck hunting. He learned to navigate his outboard at night, and liked it. The longer he fooled around with boats, the more he wanted to undertake the New Orleans-St. Louis adventure.

Unlike all others who have had their names inscribed on the Koenig Cup, Sawyer hankered to do it alone. Nobody has called him the Lindbergh of the Mississippi River race, but somebody might.

A heartbreaking experience kept Sawyer from winning. He could practically smell St. Louis ahead of him when he ran aground on a sand bar 30 miles from home, beaten and exhausted. Counting the miles when he was lost, and when he was backtracking for some reason, he had covered far more than the distance between New Orleans and St. Louis, in better time than anybody before him.

But they only pay off when you actually check in at the St. Louis yacht harbor with an official timer, so Sawyer that year, and until 1954, was just another also-ran.

An Alton, Illinois, boat dealer, Roy F. Smith, had a co-pilot with him when he tried for the record that same year, 1952. Smith made it all the way to St. Louis. But as a result of engine trouble, navigation setbacks and running aground on innumerable sand bars, one of which pitched both pilots into the river, Smith failed by some seven hours to break the 21-year-old record.

In 1953, Smith tried again, also aided by a co-pilot, and this time he got his name on the Koenig Cup by shaving 34 minutes off the 1931 record. His time was three days, seven hours and 12 minutes. His boat, powered by two outboard motors, bore the proud name of *Mark Twain.*

Up to that summer of 1953, the *Robert E. Lee* had been doing pretty well. In all the 83 years since its historic race, nobody had really beat its time by very

much. You could argue that the *Lee* was still the king of the river, for it had covered a 1,250-mile course in 90 hours and 30 minutes, an average of about 14 miles an hour, while Smith in piloting his modern craft over a course that had been shortened to 1,050 miles averaged only a little better than 13 miles per hour.

The first complete victory over the *Lee's* time came in October, 1953, when Frank G. Burkarth, a St. Louis businessman, pushed the average speed up to 17 miles an hour and made the run in two days, 13 hours and 22 minutes.

As river expeditions go, this one was on the de luxe side. Burkarth owned a 37-foot cabin cruiser powered by two 145-horsepower engines. He had a pilot, Capt. John Ritchie of Cape Girardeau, Mo., and a mechanic. One of them could catch 40 winks while the other two handled the boat, so the fatigue problem was minimized. In any case, Burkarth's time was the first significant paring of the record.

THESE BIG OUTBOARDS supply the power for Lee Sawyer's boat, the *Huckleberry Finn*, with which he put his name on the Koenig trophy in 1954.

Since then, two starters have bettered Burkarth's record. One was Sawyer, traveling alone, who made a time of two days, eight hours and 56 minutes in August, 1954.

A year later, in August, 1955, two brothers who operate a body-and-fender shop in Little Rock, Ark., Raymond and Charles Loetscher, became the present holders of the Koenig Cup. They used a homemade 26-foot boat powered by three V-8 automobile engines rigged to operate in unison. In addition to the Loetschers, the crew included a 22-year-old navigator who had never been on the river before, but who never got lost.

The Loetschers had two notable experiences. At Arkansas City, they were stopped by harbor police for speeding. Their boat was capable of 45 miles an hour and the speed limit at that point was 20. As soon as the police could be convinced that speeding was the Loetschers' business, the river patrol waved them on with an apology.

The boat hit a sand bar later, near Ste. Genevieve, about 40 miles below St. Louis, and it took four hours of frantic digging with bare hands to get it back in the water.

After that mishap, the Loetschers sped into St. Louis. Their engines were heated up but they established a new record of two days, four hours and 53 minutes. Their average speed was just under 20 miles an hour. The *Robert E. Lee's* time had now been shortened from 90 hours to a little less than 53, and that is the mark that Mississippi racers will be shooting at this summer.

All things considered, Lee Sawyer—the man who came close in '52 and made it in '54—remains the most interesting figure in the curious world of river racing. A chunky, burly man of 45 with a beautiful wife and two teen-age children, he seems driven by some fierce inner urge. Reason tells him that the trip from New Orleans to St. Louis can be made in 40 hours, and he is determined to do it before anybody else does—why, he cannot exactly tell.

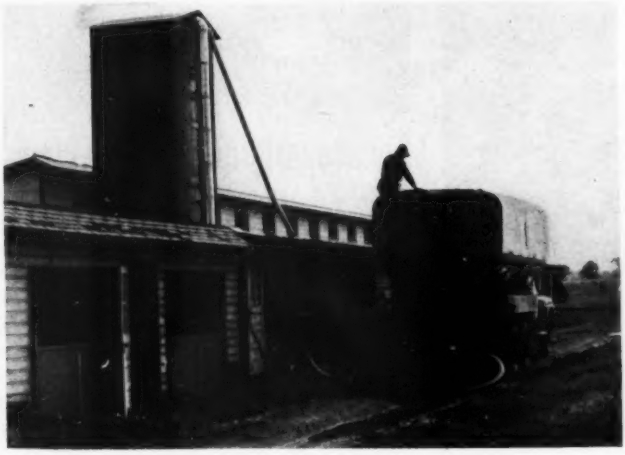
Sawyer's 1954 run, in which he single-handedly knocked 4½ hours off the record with a time of two days, eight hours and 56 minutes, was beset by troubles that might have daunted a lesser man.

He came to hate the long tows of river barges, which kicked up the water and compelled him to reduce speed. Between New Orleans and Cottonwood Point, above Memphis, he counted 139

[*Continued on page 232*]

Recruits Get In Their First Licks at Realistic Targets

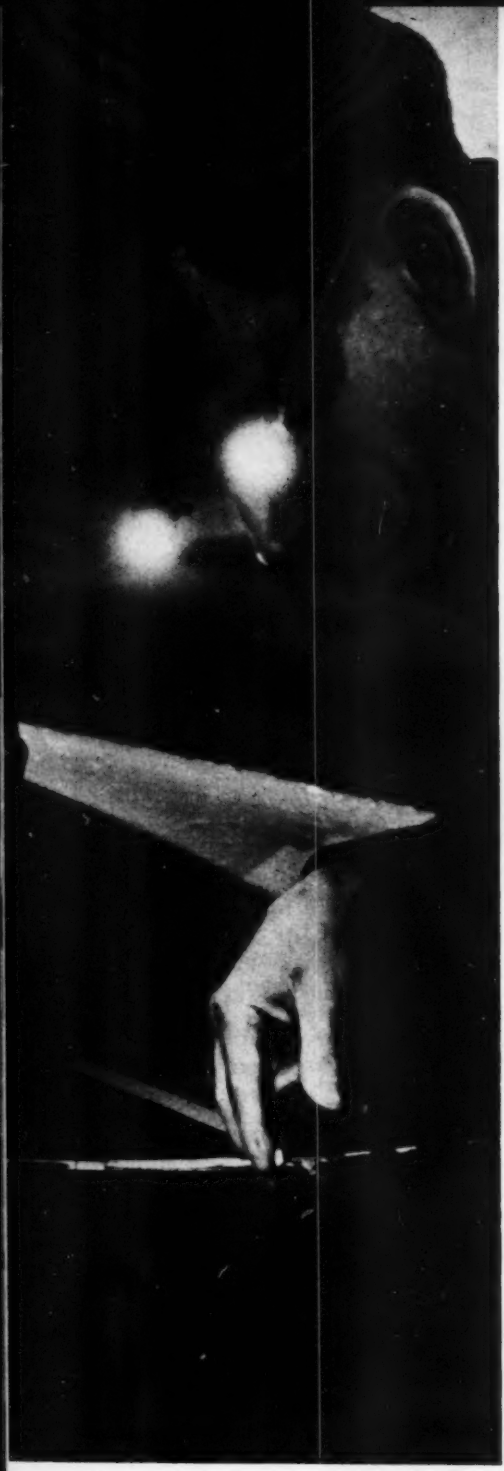
INFANTRY trainees at Fort Carson, Colo., and at Fort Jackson S.C., are participating in a new "no-dry-run" experiment in rifle training. From the beginning, they fire from foxholes, as silhouettes ("Pop-Up Petes") rise up unexpectedly. The Army hopes that this realism will turn out marksmen faster.



Truck Unloads Feed into Bins Through Hose

LIKE a tank truck delivering gasoline or fuel oil, this pneumatic pumper pipes bulk feed right where the farmer wants it—into his feed bins.

Made by Sprout, Waldron & Co. of Muncy, Pa., the Feed Piper unloads 18 to 24 tons an hour. Its built-in pump works off the truck engine.



What's New

Headlights Built-in spotlights on this East German mechanic's spectacles leave his hands free to work in dark corners. Bulbs and reflectors are mounted on the corners of the plastic eyeglass frames, and a wire runs to a small battery in his hip pocket. The gadget is said to be useful also for reading in bed. The headlights and the other new products pictured on these two pages were exhibited recently at the annual Leipzig trade fair, which since the war has become a show window for technical developments in the Communist countries of East Europe.

Kerosene Radio Made in Moscow for use in rural areas, this all-wave radio is reportedly powered by the kerosene lamp hanging above it. A group of thermocouples is heated internally to 570 degrees by the flame. Fins cool the outside to about 90 degrees. The temperature differential generates enough current to operate the low-drain receiver. Regular listeners may want fur-lined union suits, though: It works best in a room with open windows.

in Communist Countries

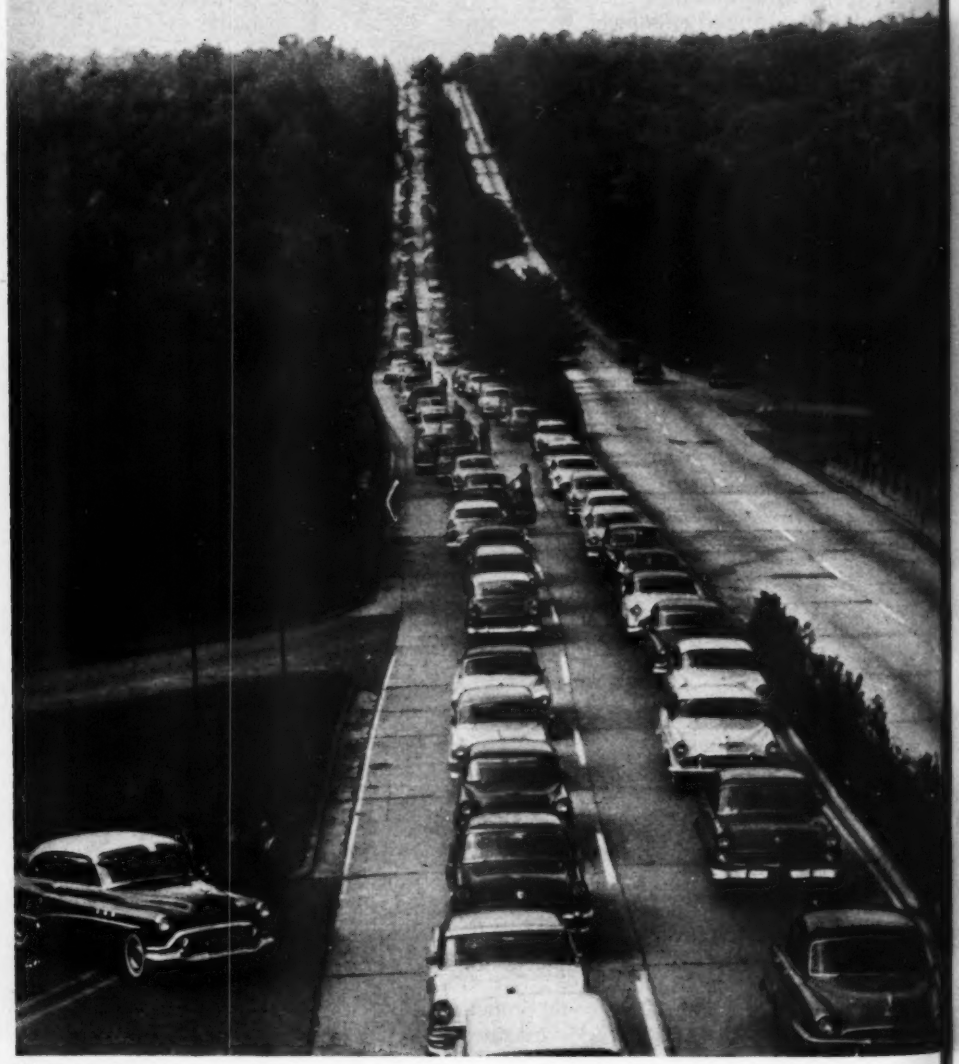
Snowdozer The earnest lad at the right is on the prowl for some snow to push around with his new sidewalk snowplow. For maneuvering in close quarters, the wheels can be cramped over to give a turning radius of less than one yard. Engine is a six-hp. four-cycle one-lunger, geared so that the 750-pound vehicle can move deep snow. That big lever raises the blade.

Sturdy Sedan The fifteen Teutons perched atop this little car don't ride about in this fashion; they are simply demonstrating the strength of its light plastic body. The front-drive car, a P70 Zwickau, weighs 1,750 pounds when not festooned with East Germans, which is light enough for it to be propelled at 55 m.p.h. by its 22-hp. two-cylinder engine.

Reverse Engine If the engine under the hood of the Wartburg, above, looks peculiar, it's because it is. The three-cylinder engine is out in front of its radiator. This makes it easier to heat the car's interior in the winter, and also makes space for the transmission and differential of the front-drive car. Developing 37 hp., the little East German vehicle comes in three models—a hardtop, a convertible and a station wagon.

REPORT TO MOTORISTS

Keeping You Out of That Traffic Jam



New devices count cars and do figures in their heads to save you from that awful accordion.

By Devon Francis

THERE is a hilly road in the state of Connecticut that has more curves than Marilyn Monroe, and this summer some funny-looking things will be put up alongside it. They look like lighting fixtures. But they aren't.

They are tools in an experiment designed to keep you out of—or at worst, alleviate—that deadly bumper-to-bumper traffic that plagues motorists everywhere from the time of spring's first crocuses to autumn's first frost.

The results of the experiment on Connecticut's Merritt Parkway, which permits no cross traffic, are being awaited by traffic engineers all over the U. S., including, probably, the experts in your own town.

The funny-looking things, on standards, will be there to count cars. They will work by radar and report their findings to electronic brain boxes at a police headquarters miles away. Teamed with them will be the more familiar radar speed meters, boon of the traffic cop, bane of the heavy-footed driver.

By measuring traffic volume and clocking car speeds, Connecticut's state police expect to determine some of the causes of that great American institution, the traffic jam. It's known to the experts on traffic control as an "accordion."

John L. Barker of the Automatic Signal Division, Eastern Industries, the world's biggest manufacturer of traffic-actuated signal systems that "think," says of the accordion, "If you can keep one from getting started, you've got it made. If you can't, oh brother!"

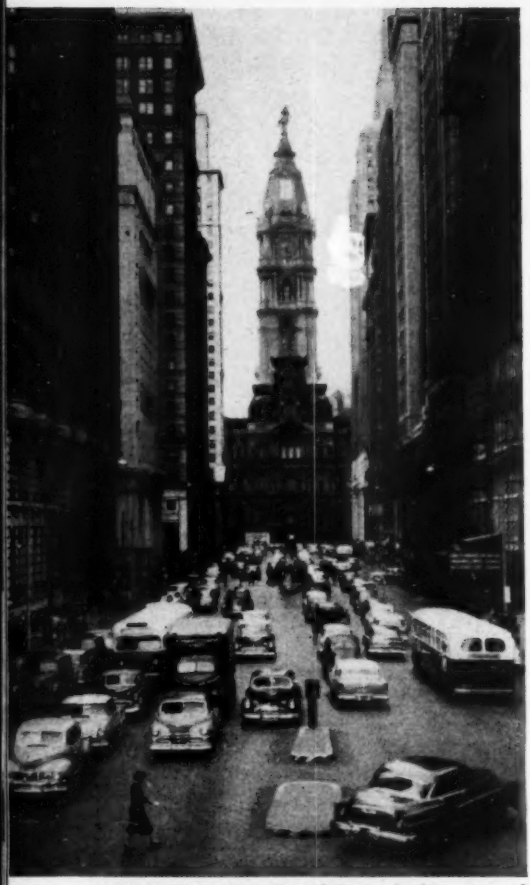
Finding out why accordions occur isn't as simple a job as you might think. Traffic may whiz along at one point on a road. Five miles ahead, it slows to a crawl. Two miles beyond that, the traffic flow is okay again.

What happens in between? Do cars entering the stream of traffic slow every-

ON PHILADELPHIA'S BROAD STREET, this pedestrian presses a button to get a green light. A master control decides when she can cross.

PAD IN PAVEMENT triggers "local controller" at cross-street intersection as each car rolls over. The signal is then relayed to a "brain."

SPEED-DELAY METER, mounted on car seat, is used by Philly traffic engineers to find the driving time from City Hall to outlying areas.



A FAMOUS VISTA, Broad Street looking toward City Hall, is the scene of one of the nation's most elaborate experiments in traffic speedups, using volume-sensitive control signals.

thing down? Or cars leaving it? Or both? Is it unequal speeds in adjacent lanes? Lane width? Cars going too fast? Too slow? Is it on account of hard-to-read signs? Poorly marked lanes? Inadequate separation between opposite-going traffic? Bridges with railings so close to the roadway that motorists automatically swerve from them, confusing traffic on inner lanes?

Traffic-control people all over the country would like to have the answers. To help supply them, the brain boxes, newest thing in traffic studies, will digest traffic-flow information and give instantaneous readings at any second of any minute of any hour. They are kissing cousins of the monstrous and awesome electronic computers that perform near-miracles of higher mathematics for science and industry.

The Connecticut study is only one small part of the fight against the traffic jam. All over, the experts are speeding up traffic day by day.

The traffic-responsive, or "thinking," traffic light is the heart of many of the new traffic-control systems. It balances cross traffic against main-street traffic as delicately as a postal weight scale and apportions the time between red and green accordingly.

It's considerate. It "remembers" the motorist who was caught when the light turned red. Presently it says, "Okay, bub,

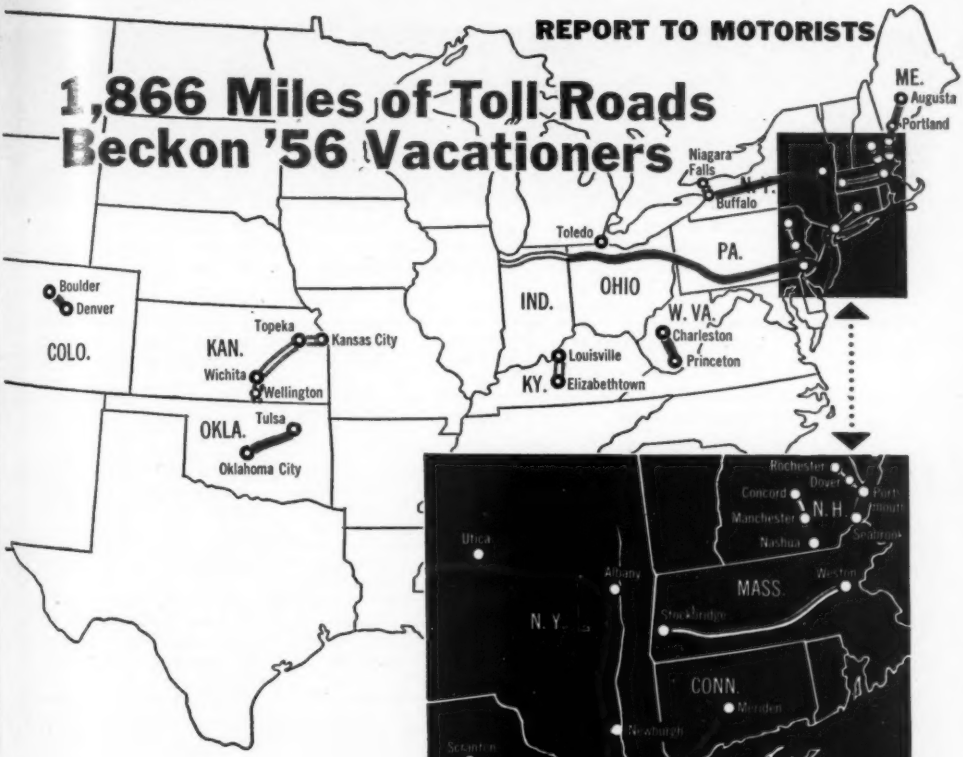
[*Continued on page 226*]

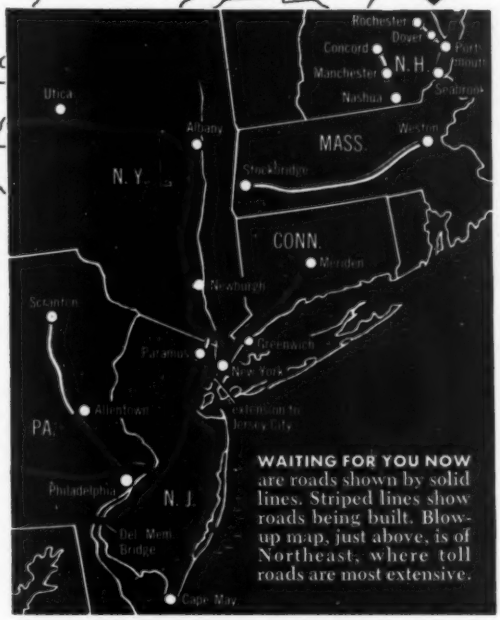
OVERHEAD RADAR UNIT, shown here on a Norwalk, Conn., street, counts cars as pavement pads do, but less accurately. Norwalk is home of Eastern Industries, which made the unit.

RADAR COUNTER is in simple plastic case with dome at bottom. It emits microwaves. Each moving vehicle changes the wave length of the reflected signal, closing a counting relay.

REPORT TO MOTORISTS

1,866 Miles of Toll Roads Beckon '56 Vacationers





WAITING FOR YOU NOW are roads shown by solid lines. Striped lines show roads being built. Blow-up map, just above, is of Northeast, where toll roads are most extensive.

THERE is fresh balm, at this vacation season, for that itchy accelerator foot. More toll highways, unmarred by red lights, lie in wait.

That modest complex of high-speed roads that beckoned to you a couple of years ago—when this magazine first published a map of pay turnpikes—has grown.

Take a look at the new map. In 1954 the toll turnpike mileage totted up to 800. Come July, when a snip of the shears will open Kentucky's new turnpike, the mileage will be 1,866. By November it will be almost 2,300; by January more than 2,500.

Two years ago only 10 states had toll roads, most of them on the densely settled northeastern seaboard. By the turn of the new year, the traffic interchange, with its sweeping, parabolic curves, will be a fixture in 15 states, four in the Midwest.

In less than six months from now, that dream of driving from New York to Chicago without encountering a traffic light will be real—on 875 miles of ribbon that cleave Pennsylvania's green-clad mountains and bisect the farm-scented hills and flatlands of New Jersey, Ohio and Indiana.

Please turn the page for complete toll-road information

What you want to know about Toll Roads

STATE	NAME	FROM	TO	LENGTH (MILES)	NUMBER OF INTERCHANGES	TOLL PER MILE (CENTS)	NUMBER OF LANES (EACH DIRECTION)	LANE WIDTH (FEET)
COLORADO	COLORADO TURNPIKE	DENVER	BOULDER	17	1	1.5	2	12
CONNECTICUT	MERRITT AND WILBUR CROSS PARKWAYS	GREENWICH	MERIDEN	67	31	[a]	2	12-13
FLORIDA	SUNSHINE STATE PARKWAY[c]	HOLLYWOOD	FT. PIERCE	104	8	2	2	12
	BUCCANEER TRAIL	FERNANDINA BEACH	MAYPORT	17	None	6	1	11
INDIANA	INDIANA TOLL ROAD[d]	OHIO LINE	NEAR CHICAGO	156	9	1.2	2	12
KANSAS	KANSAS TURNPIKE[e]	KANSAS CITY	WELLINGTON-OKLAHOMA LINE	236	12	1.6	2	10-12
KENTUCKY	KENTUCKY TURNPIKE[f]	LOUISVILLE	ELIZABETH-TOWN	40	7		2	12
MAINE	MAINE TURNPIKE	KITTERY	AUGUSTA	113	16	1.8	2	12
MASSACHUSETTS	MASSACHUSETTS TURNPIKE[g]	WEST STOCKBRIDGE	WESTON	123	14	2	2-3	12
NEW HAMPSHIRE	NEW HAMPSHIRE TURNPIKE	PORTSMOUTH	SEABROOK	15	1	1.3	2	12
	CENTRAL TURNPIKE[h]	NASHUA	MANCHESTER	21	9	1.7	2	12
	SPAULDING TURNPIKE[i]	PORTSMOUTH	ROCHESTER	23	7		2	12
NEW JERSEY	NEW JERSEY TURNPIKE	RIDGEFIELD PARK	DELAWARE MEMORIAL BRIDGE	118	18	1.5	2-3	12
	EXTENSION	NEWARK BAY	TURNPIKE	8	4	4.2	3	12
	GARDEN STATE PARKWAY	PARAMUS	CAPE MAY	164	80	1.4	2-5	12
NEW YORK	NEW YORK THRUWAY[j]	NEW YORK CITY LINE	BUFFALO	427	53	1.2	2-3	12-13
	SAW MILL RIVER PARKWAY	NEW YORK CITY LINE	HAWTHORNE CIRCLE	11.1	11	[k]	2-3	10
	HUTCHINSON RIVER PARKWAY	NEW YORK CITY LINE	GREENWICH, CONN.	11.2	15	[k]	2	11.5
OHIO	OHIO TURNPIKE	NEAR EAST PALESTINE	INDIANA LINE	241	15	1.2	2	12
OKLAHOMA	OKLAHOMA (TURNER) TURNPIKE	OKLAHOMA CITY	TULSA	88	4	1.6	2	12
PENNSYLVANIA	PENNSYLVANIA TURNPIKE[n]	OHIO BORDER	EDGELY	470	38	1	2	12
	EXTENSION	PLYMOUTH	SCRANTON					
WEST VIRGINIA	WEST VIRGINIA TURNPIKE	CHARLESTON	PRINCETON	88	6	1.8	1-1½	12

NOTES

[a]Greenwich, Milford toll stations 20¢, Wallingford 15¢

[b]Curbed grass areas on Merritt interspersed with shoulders; 8 ft. on Wilbur Cross

[c]To open January, 1957

[d]To open November 15

[e]To open in October

[f]To open July 1

[g]To open in November

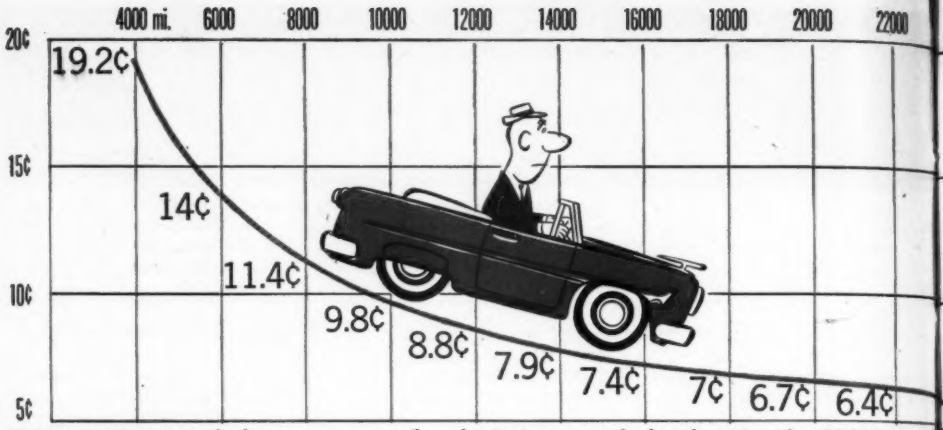
[h]Open Nashua-Manchester; open to Concord 1957

LANE WIDTH (FEET)	WIDTH OF SEPARATION STRIP (FEET)	TYPE OF SURFACE	MAXIMUM GRADE (PERCENT)	MAXIMUM CURVE (DEGREE)	WIDTH OF OFF STRIP (SHOULDERS)	TOP SPEED LIMIT	NUMBER OF REST OR RECREATION AREAS	NUMBER OF FUEL AND FOOD STOPS	BRANDS OF FUEL AND OIL AVAILABLE
12	20	Concrete	5	4	10	65	None	None	None
2-13	20	Concrete	7	6	[b]	55	2 (Wilbur Cross only)	5	Cities Service, Crown, Trojan
12	12	Concrete	3	1.5	10	60	None	3	
11	None	Asphalt	2		10-12	60	9	None	
12	40	Concrete	4	2.5	10	65		5	Cities Service, Pure, Shell, Sinclair, Texaco
-12	20	Asphaltic concrete Reinforced concrete	3	3	10		6	6	Phillips, Sinclair, Socony, Mobile
12	12	Concrete	3	3	12	60	2	2	Gulf, Texaco
12	26	Asphaltic concrete	3	1	10	60	None	6	Cities Service, Esso
12	6-18	Macadam Asphaltic concrete	3.5		10	60	None	10 food 12 fuel	
12	24	Asphaltic concrete	3	3	10	60	24	None	
12	24	Bituminous macadam	4	6	10	60	20	None	
12	24	Asphalt	4	4	10	60	None	None	
12	26	Asphaltic concrete	3	1.9	10-12	60		12	Cities Service
12	4-6	Concrete	3	4.7	None	50	2	2	Cities Service
12	5-600	Bituminous concrete, concrete	3	3	10	60	22	7 (and 2 fuel only)	Atlantic, Cities Service, Esso, Texaco
2-13	20-800	Concrete	3	2	9	60	17	25	Atlantic, Calso, Cities Service, Esso, Gulf, Sinclair, Sunoco, Texaco
10	Variable	Reinforced concrete	5		[m]	40	None	2 fuel 1 food	Socony, Texaco
1.5	4	Reinforced concrete	6.5		[m]	40	None	1	Kesbec
12	40	Concrete	3.2	2.5	10	65	16	16	Cities Service, Pure, Shell, Sinclair, Texaco
12	15	Asphaltic concrete	3	1.5	12	70	1	5	Phillips
12	10	Concrete	3	6	10	70		29	Atlantic, Esso, Gulf, Pennsylvania
12		Concrete	5	5.5	9	60	3	3	Esso

[i]To open to Dover this summer
[j]Other sections under construction or planned include Buffalo-Niagara Falls, Buffalo-Erie and links to New England Thruway and New Jersey toll roads
[b]One 10¢ toll

[m]Curbed grass areas
[n]Northeastern Extension to open late 1956

Where information is not listed, it was not available at press time



THE MORE YOU DRIVE the less you pay per mile —up to a point. At 10,000 miles a year, you're beginning to get the best bargain. After 30,000 miles, the experts say, it's time to think about

REPORT TO MOTORISTS

What Does It Cost

The cents-per-mile depends not only on how <u>much</u> you drive but <u>how</u> you drive, <u>where</u> you live.

By Edward D. Fales Jr.

BACK in 1940, and before, it was common talk that driving cost three to six cents a mile. Many salesmen got a nickel a mile "expense money" for driving their cars.

But that was before the cost spiral. High-test gas was 24 cents and you could get a new car for $1,000.

Today the same gas averages more than 30 cents, practically any car costs over $2,000, insurance is up, and toll roads are appearing right and left. Speeds of 60-70 are routine on most new roads—and they burn up more gasoline and wear tires out faster.

So what's happening to *your* pocketbook?

Some interesting basic figures come from the AAA and two Chicago accounting houses: the Dartnell Corp. and Runzheimer & Co.

The Dartnell company says you're about right if you figure that it costs you $8.95 a week ($1.28 a day) when you drive *100 miles a week* on good, flat, uncrowded roads. That's 8.95 cents a mile. In big cities, or on poor roads, you pay 9½ cents a mile; in mountains nearly 10 cents.

But if you go 200 miles a week, you get your miles "wholesale" (8.7 cents in big cities; 8.2 cents in open country).

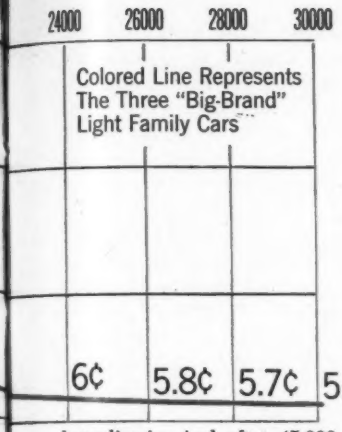
Runzheimer & Co. have a different kind of formula. It, too, is widely used by industry. You climb three easy steps to get your basic costs. (But remember that word *basic*. You'll see why.)

Runzheimer figures Mr. Average pays 9.8 cents a mile if he drives 10,000 miles a year. That's the figure for fairly new "low-priced" cars. It will vary a little for higher-priced or older cars. Here's how Runzheimer figures it:

STEP A: Daily variables. Let's assume you own a $2,000 car that's not over two-and-a-half years old. You bought it new and you don't pull more than 18,000 miles a year through the speedometer.

So you jot down:

Gas and oil . . .	2.29¢ a mile
Maintenance . . .	.74¢ " "
Tires . . .	.51¢ " "
	3.54¢ a mile



trading-in. And after 45,000 miles, the repair bills really begin to climb. If you're spending $10 per 1,000 miles for repairs, it's time to start thinking seriously of buying a new car.

You to Drive a Car?

Next, Runzheimer tackles:

STEP B: Fixed Costs. These are good U. S. averages:

Fire and theft insurance..	$17.81
Prop. damage + liability ($15,000 to $30,000)...	86.65
Licenses.....	16.83
Depreciation....	507.36
	$628.65
	or $1.72 a day

STEP C: Add them up.

If you're like a lot of families, the AAA says, you roll up 10,000 miles a year. With this good round figure it's easy to figure your basic average:

10,000 miles @ 3.54¢...	$354
365 days @ $1.72.....	628
	$982
	or 9.8¢ a mile

But suppose you drive only 5,000 miles, as a good many city people do:

5,000 miles @ 3.54¢...	$177
365 days @ $1.72....	$628
	$805
	or 16.1¢ a mile

If you're a traveling man and go 20,000 miles a year you've got a real bargain:

20,000 miles @ 3.54¢...	$708
365 days @ $1.72.....	$628
	$1,336
	or 6.7¢ a mile

For accountants these are well-tested U. S. averages. They supply a firm working base when a company wants to study its travel costs.

But for you as an individual there's one trouble: your own costs may be quite a bit higher or lower depending on where you live and how you drive. Near Richmond, Va., you may get 16 miles per gallon on a new car; on mountain roads in Idaho you may get only 15. Near Richmond tires cost only .39 cents a mile; near Spokane, Wash., you chew them out at .68 cents a mile. *Insurance* near Spokane costs a lot more (as it does in Chicago and San Francisco, too). And car delivery costs run as much as $200 less in some areas.

So, to bring the figures a shade closer to what driving a car probably costs you, Runzheimer has drawn up a "Where Do You Live?" table (next page). It lists local averages for different parts of the country, and you can use those figures instead of the national averages for both

"WHERE DO YOU LIVE?" TABLE

	Area "per-mile" cost (for use in Step A)	Area "fixed daily cost" (for use in Step B)
Portland, Ore.	3.65¢	$1.73
San Francisco	3.55	1.96
Spokane	4.05	1.69
Sacramento	3.90	1.82
Boise	4.10	1.59
Tucson	3.90	1.70
Butte	4.00	1.48
Denver	3.85	1.74
Las Vegas	3.85	1.68
El Paso	3.70	1.59
Omaha	3.75	1.63
Dodge City	3.60	1.62
Corpus Christi	3.60	1.70
Duluth	3.45	1.79
Des Moines	3.15	1.67
Kansas City	3.25	1.75
Joplin	3.55	1.60
St. Louis	3.30	1.79
Tulsa	3.35	1.72
Ft. Smith	3.80	1.66
Houston	3.25	1.67
Jackson, Miss.	3.80	1.69
New Orleans	3.75	1.68
Chicago	3.25	1.72
Milwaukee	3.25	1.71
Louisville	3.50	1.64
Nashville	3.55	1.67
Birmingham	3.55	1.66
Traverse City	3.45	1.58
Youngstown	3.20	1.71
Syracuse	3.40	1.76
Elmira, N. Y.	3.20	1.73
Pittsburgh	3.45	1.69
Williamson, W. Va.	3.80	1.65
Chattanooga	3.85	1.73
Saratoga Springs	3.40	1.92
New York City	3.20	2.14
Chelsea, Mass.	3.25	1.93
Bayonne	3.20	1.81
Norfolk	3.35	1.60
Charleston, S. C.	3.35	1.66
Miami	3.45	1.76

daily variables and fixed costs in Steps A and B above. You get the figures for your area by finding the city nearest to where you live.

The averages, whether national or local, may not, however, include all your particular costs, especially for repairs.

The national maintenance figure of .74 cents a mile covers car washes, greasing, new plugs, oil-filter changes, carbon removal, brake relining, wheel and pump repacks, carburetor adjustment. But if you need a new generator or a battery, or dent a fender or pay for a rear-end job—that's extra.

How much insurance do you have? If more than a $15,000 and $30,000 policy, add your additional premium costs in Step B. (Don't forget your collision insurance, if you carry it.)

Do you get 30,000 miles on your tires? Accountants say that this is normal for new cars with five carefully rotated tires. But if you get only half that, as some drivers do, your tire cost is doubled. Change the .51 cents item in Step A to 1.02 cents a mile.

Do you drive fast? If your speedometer shows 60-70 more than it shows 45-55, add an extra .2 cents a mile for gas.

Do you drive with spurs on? Your personality may save—or cost—you money. If you are an exceptionally even driver, never use speed bursts and start slowly, deduct half a cent a mile. If you are first away at lights, load your engine on hills, make fast stops, add half a cent.

The cowboy who passes you with tires squealing is paying a penny extra per mile for being a hot-shot. END

New Rail Crossing Signs Spell Out Luminous Warnings

CAUTION signs coated with a sheeting that reflects a night-driving motorist's headlights as he approaches are now guarding many of the country's railroad grade crossings. The crossbuck blades of the stand at right, made by Kaiser Aluminum, are said to be not only safer but to have a longer life than signs made of steel or wood, since they will not rust, rot or warp.

New for Boatmen

1. Package to Boat in 60 Seconds. Sturdy enough for an outboard, this three-seat boat folds into a 90-pound, 11-foot flat package that can be carried or strapped to the top of a car. For launching, the plastic-coated marine-plywood boat is opened up to its four-by-10-foot size, and the seats and a transom brace are put in place. The brace doubles as a mounting bracket for the motor.

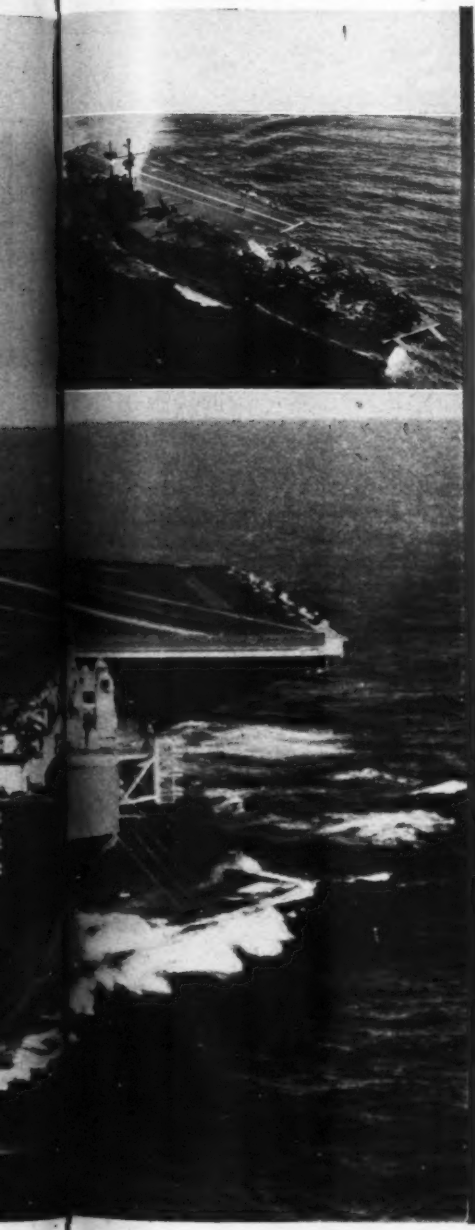
2. Meter Measures Fishing Line. Here is a 3½-ounce plastic device for a rod and reel that gives you bait depth or casting distance by measuring the line payed out as you troll or cast. Looped once around a capstan on the meter, the line brings into action a train of eight nylon-resin gears. A dial registers pay-out to 100 feet and then repeats. It can be reset when lifted and rotated back to zero. The meter is also useful for sounding or measuring.

3. Make-'Em-Yourself Lures. A kit containing aluminum molds, jars of colored liquid plastic, hooks and stylus lets you make your own lures, from mayflies to the wiggly crayfish above. You heat the plastic in the molds to cast lifelike bait.

More information *about the products described on this page can be obtained from: 1. Higgs Marine Service, 300 Zerega Ave., Bronx, N.Y.; 2. Production Lathe, Inc., P.O. Box 1085, Burlingame, Calif.; 3. Clinton Sales, Inc., Cleveland.*

Forrestal's Steam Slingshots

Juggle Jets at Record Speed

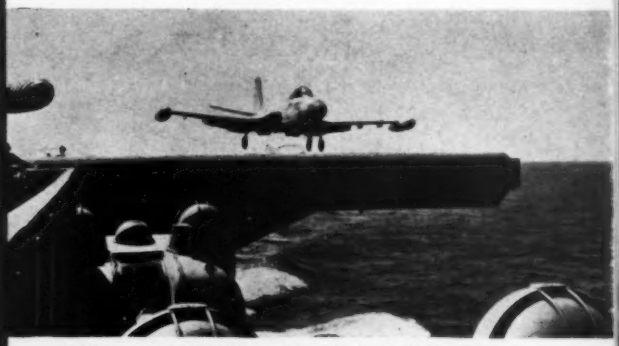


By W. W. Morris

WHEN a visitor is piped aboard the USS *Forrestal*, he is given a map of the place. That's so he won't get lost, because this mighty aircraft carrier is the world's whoppin'est warship on active duty.

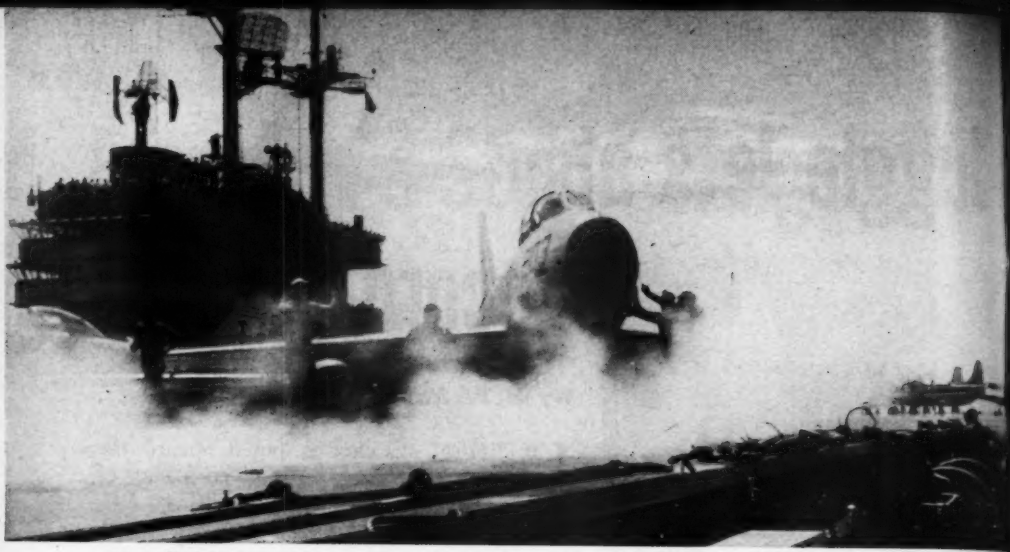
It boasts many firsts. It's the first American carrier with a "canted" deck, where incoming planes land cockeyed to the vessel's direction of travel. And it's the first American carrier to catapult its planes into the air by steam.

As a result, it juggles jets almost faster than you can blink. Its catapults can launch 32 planes in four minutes. The angled "runway" permits planes to be landed while others are being launched. With the old straight-down-the-deck system, it had to be either one operation or the other. Moreover, if a plane's tail



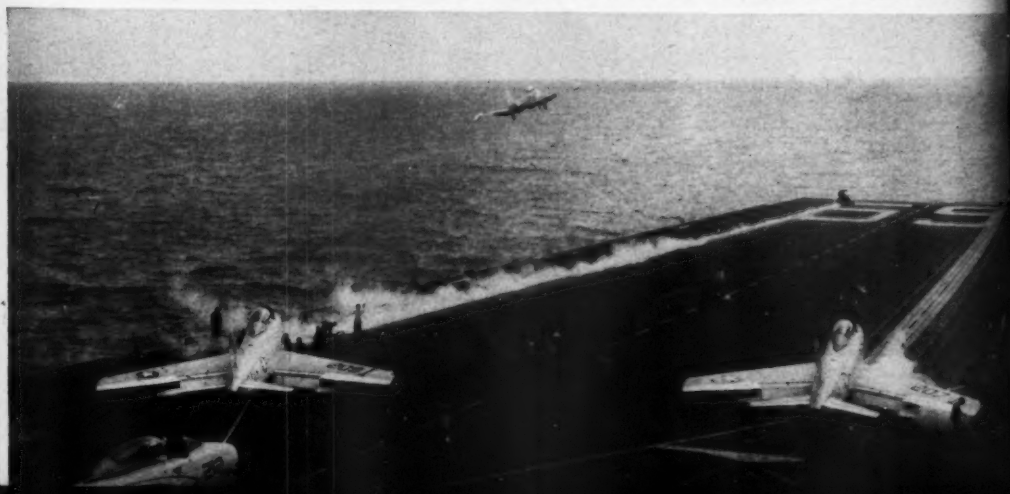
BOOTED ALOFT with a 20-mule kick by a steam catapult, one of USS *Forrestal's* jets takes off from the "canted" runway. Hemispherical structures in the foreground are part of new-type gun mounts. The huge ship rolls very little in rough seas.

CLEAVING BLUE WATER, mighty *Forrestal* (left) exhibits big port overhang accommodating crosswise landing strip. With turbines producing 200,000 horsepower, the ship can do over 30 knots. It's driven by two 4-blade and two 5-blade props.



Trundled into position on catapult, which can handle a 50-ton plane, jet is readied for takeoff.

Any moment now (above), then WHOOSH! (below) it's aloft. Two more will be off in 8 seconds.



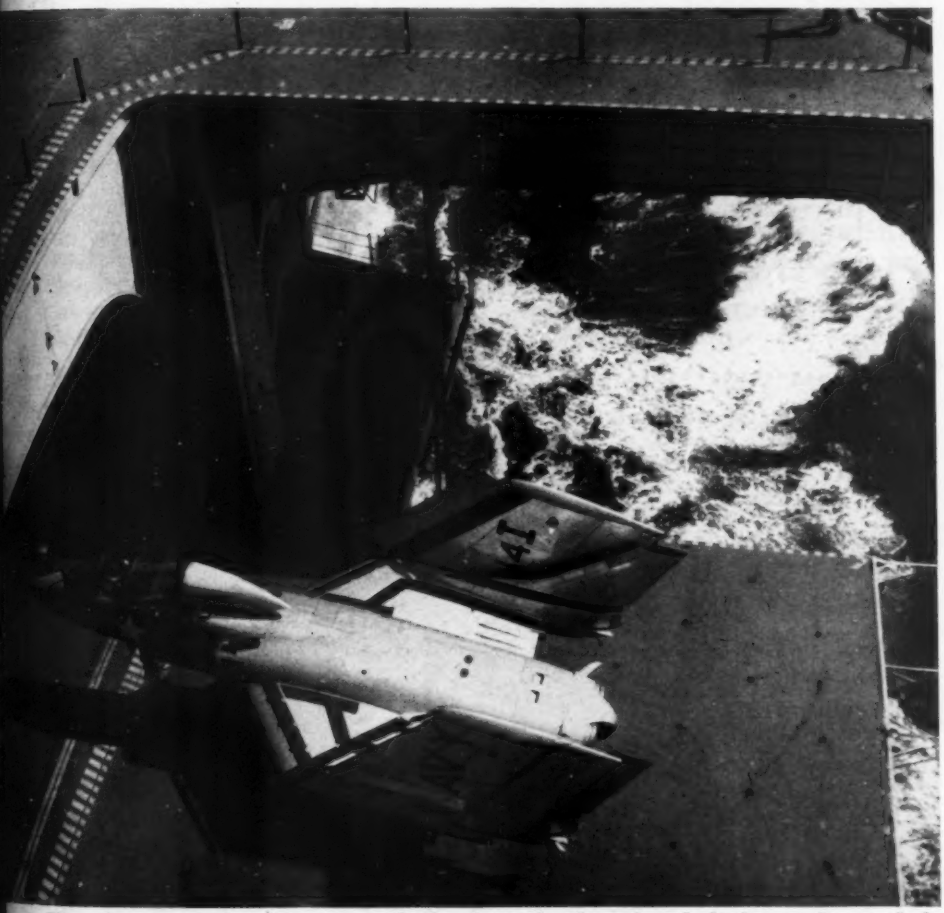
hook failed to catch a deck arresting wire, the plane ran into a temporary barrier erected for just such an emergency. On the *Forrestal,* the pilot just guns the engine and comes in again.

That isn't all. If no planes are landing, both the forward lip of the canted runway and bow section of the 1,036-foot flight deck, can be used for catapulting.

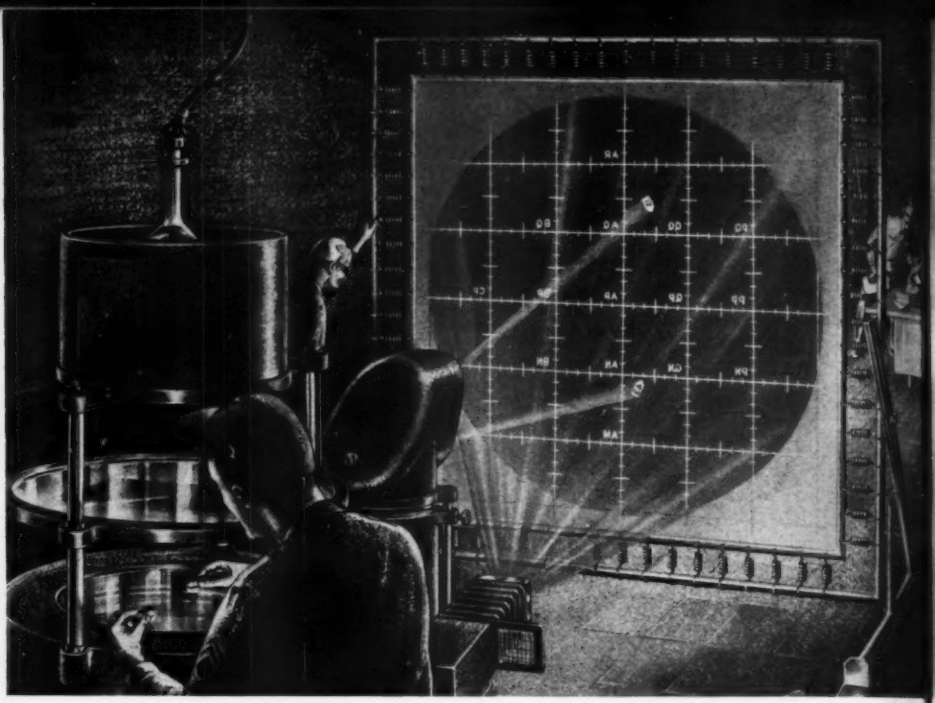
The *Forrestal*—named for the late James V. Forrestal, first U.S. Secretary of Defense—displaces 70,000 tons loaded. (For more about this ship, see PSM, August '54, p. 128.)

The new *Saratoga*—soon to go into service—will be even bigger and faster.

PLANE APPROACHES the canted landing strip from downwind to engage an arresting wire.



Four elevators, each as big as two suburban lots, take planes four decks down to hangar deck.



Radar Projector Puts Plane-Tracking Data on Big Screen Instantly

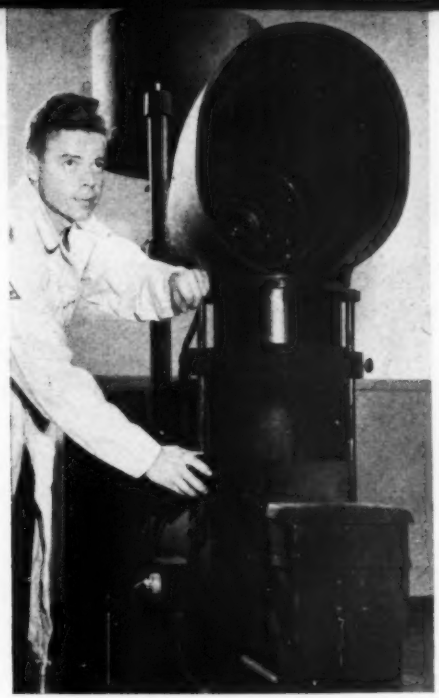
ANALYSIS of radar information for controlling and identifying airplanes will be speeded up by a new optical projection device that instantly transmits data on plane movements onto a viewing screen. This is how Sky Screen, perfected by

New Cargo Copter Lifts Bigger Load Than It Can Hold

HOVERING like some giant insect, this new cargo helicopter totes an 1,800-pound Volkswagen with ends out.

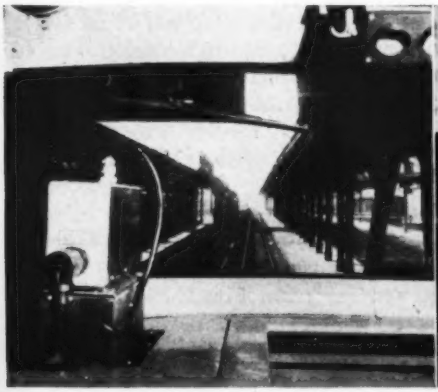
Seven-foot-wide doors on both sides and welded tubular construction make transporting of bulky cargo possible without use of slings.

The LZ-5 is a commercial version of an Army model also built by Doman Helicopters, Danbury, Conn.



Northrop Aircraft, works: Pips from the radar tube at top are transferred via a beam-splitting mirror to a 16-inch plotting surface. Glass-chip markers with arrows and numbers are moved by an operator to coincide with target locations and directions. These markings are projected by a system of reflectors and lenses through a periscope to the screen.

The periscope projection head, shown above, swivels 360 degrees so that the screen can be put anywhere in the room.



TV Camera in Locomotive Shows Passengers What's Ahead

PASSENGERS on the Rock Island's *Jet Rocket* between Chicago and Peoria, Ill., get the same view in the lounge car that the engineer has from his cab. It's a railroad application of closed-circuit television. The camera, set up in the locomotive at left, flashes scenes of the road ahead to a lounge-car receiver.

The Lumberyard

Need any snakewood, teak, ebony or dao? Constantine's has it, as customers from Christmas Island to Iceland have found out.

By David R. Lindsay

Prefabricated inlaid borders are sold by the yard; a few contain more than 50 different pieces of wood to the inch.

WHEN the FBI was trying a while back to track down a fugitive who was known to be a skillful amateur cabinetmaker, the agents enlisted the aid of a unique lumberyard, Albert Constantine & Son, Inc. of New York City. Sure enough, in the lumber company's records of mail-order sales they found their man's latest address.

Like former Secretary of State Dean Acheson, TV's Dave Garroway, and many other celebrities and just plain home craftsmen from Iceland to South America and the far Pacific to England and Iraq, the FBI's fugitive had turned for wood to a place that stocks more kinds than most woodworkers can name.

On the racks at Constantine's, which this year is celebrating its 144th birthday by breaking in a new building, you won't find a stick of fir or pine. But you'll find sweet-smelling planks and veneers of Honduras mahogany, Burma teak, American curly maple, Brazilian rosewood, English oak, Indian padouk (a striking, almost scarlet wood), French walnut, Gaboon ebony, lignum vitae (the hardest wood known, so dense it won't float), snakewood, cocobolo, lemonwood, bubinga, and some 100 or so others dear to the cabinetmaker's heart.

Cabinet woods are stocked in 306 pre-cut sizes, dressed four sides. Wood and plywood racks are open to customer inspection. Large blocks for carving and turning are also carried for woodwork enthusiasts.

Orders from South Pacific. Almost every time a ship leaves Christmas Island for the U.S.A. it carries an order from a craftsman there for American cherry or black walnut and some lacquers and stains. Two monks in Chile recently ordered a few hundred square feet of veneer from Constantine's, and shortly afterward a man telephoned from Alaska

Known 'Round the World

to have some ebony air-expressed so that he could get a wedding present finished on time.

Usually, Constantine's doesn't hear what happens to the wood and veneer that it ships, but in a few cases it has found out. A Mr. Bates, who buys oak and birch, is better known by the name Peg Leg. A professional dancer who appears on TV and has only one leg, he carves his own wooden legs from the lumber he selects. A famous neurologist, Dr. Hubert S. Howe, used to buy small pieces of birch. He made batons. One of them, which he had given Maestro Arturo Toscanini was auctioned off at the Metropolitan Opera House for $10,000. A Mr. Fred Stark of California, who has been ordering wood in small quantities for some time, turned out to be the musical director for Walt Disney. He makes miniature organs that really play.

Veneers are sold by the square foot, come in untrimmed sheets that are 1/28-inch thick.

Mail orders are 90 percent of the company's business. An old-fashioned, 126-page catalogue with feature articles, color plates of the wood, inlaid borders, and inlaid pictures, and black-and-white photos lists the items carried. A good part of the business is in wood-finishing supplies, cabinet hardware, and special tools. The head of the firm, Albert Constantine Jr., is proud of having 137,000 active customers scattered all over the free world, including several hundred not so free—they're prisoners in state penitentiaries.

This inlaid clock is built into paneled curly maple walls of showroom.

The other side of the law buys, too. An assistant D.A. once attended one of the company's free courses for craftsmen. In the middle of a lecture the sound of sirens was heard and a policeman rushed in. The assistant D.A. hurried out to work on a water-front murder case.

Many of the 500,000 annual orders and letters the firm receives contain questions on how to perform woodwork-

Pre-cut inlays, some nearly a foot wide, are on display; inlaid wood faces for checkerboards are also stocked.

ing or finishing tasks. The man on Christmas Island wrote that he was having finishing trouble because of the high humidity. Mr. Constantine sent him some retarder to slow down the drying of lacquer. Even commercial customers ask for advice. Not long ago, a representative of the international division of General Electric telephoned for help in deciding how to finish walnut; Constantine's had just shipped 50,000 feet of it to Uruguay for GE to be used in radio cabinets.

Samples of wood are often mailed in, too, for identification, duplication or finishing advice. One morning when John Docherty, vice-president of Constantine's, came to work he found a car and trailer parked in front of the door. In the trailer, it turned out, the driver had some wood too big to mail in—a piano. He had driven in to find out how to finish the wood.

An international Wood Collectors' Society member, Mr. Constantine says there are roughly 25,000 different types of trees in the world not counting the subspecies.

In keeping with its special status in the lumber business, this woodworker's gold mine has unusual offices. The sales and showroom has samples of 126 hard woods and several inlaid pictures hanging along one wall. A large wall clock has an elaborately inlaid face. The walls are paneled in curly maple taken from the same tree which supplied panel-

Besides tool display, showroom walls have photos showing the cutting of tropical woods and several large, elaborate inlaid wood pictures.

ing for part of the White House when it was recently rebuilt and redecorated. All the offices have wood-paneled walls. The head of the firm has a fieldstone fireplace in which he has a fire going almost all winter—not of birch or oak or other local wood, but of scraps of ebony, rosewood, mahogany, and even occasionally satinwood. The smoke from satinwood will kill a canary and put people who breathe it into a sound sleep.

Customers are free to wander into the storage section of the plant—all the wood is kept indoors in the building, which covers a little more than one-fifth of an acre. Among the racks are some power saws but most of the cutting and planing of wood is done at the storage and importing yards the wood comes from. The lumber on hand is free of knots and checks and is cut square to standard dimensions and dressed on all sides. The veneers are stored in bundles, usually in sheets 1/28-inch thick, often showing the contours of the logs they came from. Instead of being sold by the board foot, like wood for building and general carpentry, lumber is sold by the square foot, with price depending on thickness and rarity. A lot of it runs quite high—often as much as several dollars a square foot.

Daughter Dorothy, her husband John Docherty and son with Mrs. and Mr. Constantine around the piano; both couples work in the plant. Below, Albert Constantine stands before a portrait of the firm's founder, John Constantine.

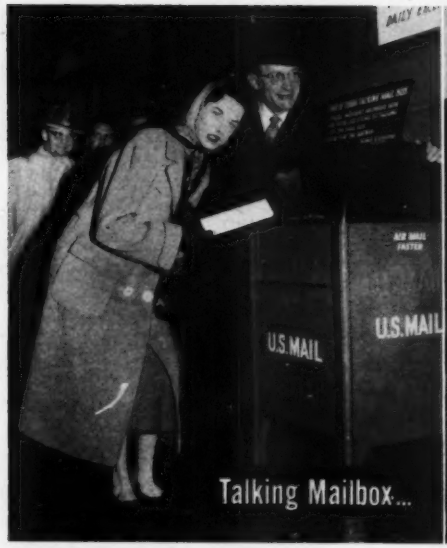
One of the oldest businesses in New York City, Constantine's was founded in 1812 by the great-grandfather of today's owner. At that time it was a log storage and inspection yard on Wall Street. As the city grew it moved uptown.*

Early in the 20th century the father of the present Mr. Constantine started importing wood and veneers. But the business of supplying amateur woodworkers grew quite by accident. Originally all customers were commercial (Constantine's still supplies Steinway and other piano companies; Sloane's, the Fifth Avenue furniture company; Spalding's tennis racket department; and other firms making folding doors, banjos, match-stick blinds, etc.).

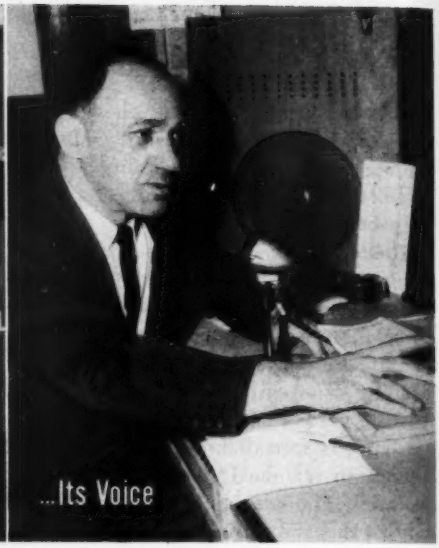
When the depression hit, the market for imported wood and veneer did more than dwindle; it disappeared, leaving Constantine's stuck with more than 20 million feet of imported veneer and lumber. Occasionally during the good years, a passer-by had wandered in to buy a board or piece of veneer for a home workshop project. Though it was strictly a wholesale business (it once sold a single lot of logs that filled 35 freight cars), it used to oblige these

*Now at 2050 Eastchester Rd., New York 61, N.Y.

[Continued on page 230]



Talking Mailbox...


...Its Voice

Post Office Goes Electronic

To SPEED up service and keep it courteous, the Post Office is trying out two electronic-age devices on its patrons.

The talking mailbox at top is in front of the Grand Central Annex station in New York. A regulation mailbox in other respects, it houses the diaphragm of a two-way communications system. An inquiry clerk at the other end answers questions concerning Post Office service. At left is a stamp dispenser in Detroit. A tape recording in it says "Thank you."

They Say Now . . .

FRANCIS B. PORZEL, ARMOUR RESEARCH FOUNDATION: "*A hydrogen bomb shock wave racing across Chicago at 1,000 miles per hour would destroy property values at the rate of a billion dollars a second.*"

DR. ALAN T. WATERMAN, DIRECTOR, NATIONAL SCIENCE FOUNDATION: "*The people who established this country . . . were men and women of endurance and tough moral fiber . . . Now the frontiers are those of the mind. Are we to shrink from equipping our children . . . to meet the challenges of a technological age?*"

DR. JAMES R. KILLIAN JR., PRESIDENT, MASSACHUSETTS INSTITUTE OF TECHNOLOGY: "*The most acute shortage we now face is a shortage of high intellectual talent adequately educated and in the right place.*"

ARTHUR C. STUDT, HOTPOINT CORP.: "*You cannot make chemicals, gasoline and electricity by hand. Advanced techniques make such difficult products possible.*"

JOHN E. MCKEEN, PRESIDENT, CHAS. PFIZER & CO.: "*Antibiotics . . . have not only saved lives . . . but have helped to sustain them by enabling the farmer to grow more food more quickly.*"

New Ideas from the Inventors

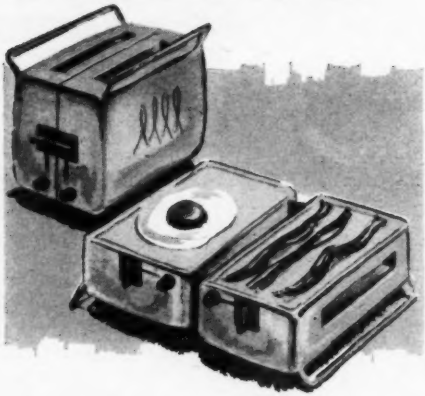
1 Side Keels to Reduce Draft. Two outrigger keels, says this inventor, could replace the usual deep, heavily ballasted one and thus let you sail lightly constructed, shallow-draft boats. The side keels would be angled so that one of the pair would cut the water vertically whenever the boat heeled over.

2 Pad to Re-Ink Ribbon. A typewriter ribbon would last longer—and make clean, uniform impressions—if it were re-inked by this attachment. As the ribbon snaked around four rollers, one would apply ink, the others would absorb the excess to prevent splatter or blur.

3 Webbed Frame to Pad Dash. For cars that don't have built-in crash panels, this attachment—consisting of a bolted-on frame and a stretched-fabric impact absorber—might prove a lifesaving accessory. The unit would fold down for access to the glove compartment.

Please turn the page for more new ideas

More New Ideas from the Inventors



4 Toaster to Double as Grill. Split down the middle and hinged as shown, this pop-up toaster would serve as a handy grill. The heating elements of the grill would warm the hot plates. The open-out design would also simplify the job of removing bread crumbs.

5 Barrow Sides to Fold Flat. With the sides of this wheelbarrow dropped, flat loads could be toted and balanced more easily. Lowering the headboard alone would permit loads to be dumped at a lower angle. The whole unit would fold for compact, upright storage.

7 Drive-In Canopy to Shield Car. These retractable canopies would be mounted on loudspeaker posts in drive-in theaters. The driver on each side of the post could extend a canopy from its housing to cover his car. It would keep vision-blurring rain off the windshield and let you keep the car windows open.

6 Tray to Keep Small Parts Clean. The tiniest parts and fittings would be kept safe—and clearly visible—on this tray. The housing would hold accessories in its wells and conceal paper for the bottom which would be renewed by pulling it through a slot as shown.

8 Cycle to Ride Two Wheels or Four. Mounted on a motorcycle, scooter, or bike, these auxiliary side wheels would fold up, either forward or back, during normal two-wheel operation. They could be let down to give a two-wheeler needed balance in stop-and-go traffic, or extra traction on wet or icy roads.

9 Phone Signal to Sound an Alarm. Thermostats or trip mechanisms, according to this patent, could be hooked into existing phone circuits to bypass regular phone switches. If fire or forced entry closed an alarm switch, a signal would be automatically telephoned to a central station and operators could dispatch help to the scene immediately.

U.S. patents *on these inventions have been granted to: 1. M. Hill, Westport, Conn.; 2. G. Hernandez G., Mexico City; 3. J. Rumsey, Lawrence, Kans.; 4. W. Taylor, Arlington, Va.; 5. R. Ensminger, Berkeley, Calif.; 6. A. Barrett, Sioux City, Iowa; 7. L. Bermejo, Meadowbrook, W. Va.; 8. L. Paldanius, Port Huron, Mich.; 9. R. Huntington, Jr., and J. Williams, Oroville, Calif.*

Three-wheeler's passenger compartment has a well for feet. Wood frame is hardboard-paneled.

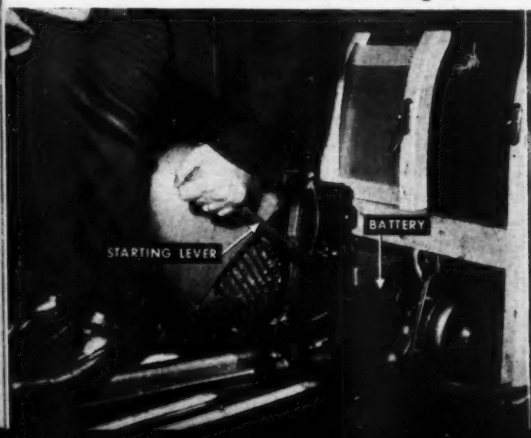
This Station Wagon Is

A FELLOW in Italy has designed something new in station wagons: a one-cylinder scooter with a sort of caboose, which is the station wagon.

The wagon part of the machine totes two grownups or up to four kids. Two of these scooters can be parked on a nickel meter. The vehicle goes about 35 m.p.h. and over 90 miles on a gallon of gas. Called the Vespa (Wasp), the new

PULL-UP LEVER starts one-lung, two-cycle engine. In Vespa's wagon version—company makes a number of types of scooter utility vehicles—motorist's seat is above engine.

FUEL TANK, at right of seat, holds one and a half gallons plus a half-pint of oil per gallon for lubrication, like an outboard motor. The tank also contains an air cleaner.



It has a hood for protection from rain . . .

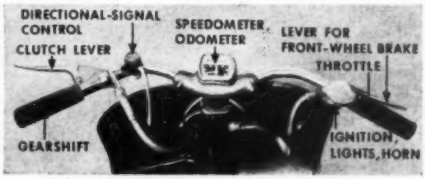
. . . Can be ridden to the train . . .

. . . For the small fry it's really a lark . . .

. . . And the thing is surely a cinch to park!

a Scooter

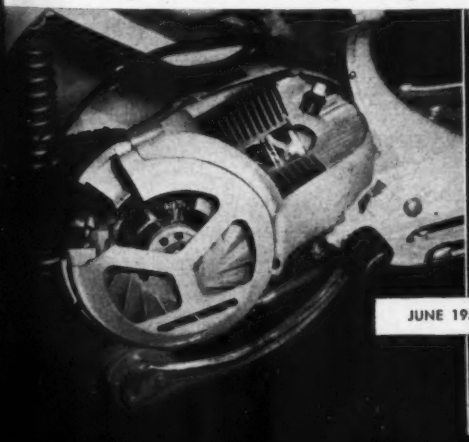
wagon sells in the U.S. for $996. It's a product of Enrico Piaggio of Genoa, the man who has been largely responsible for putting all Europe on three wheels in the last 10 years.



HAND CONTROLS require 19 separate movements to get into fourth gear from a full stop.

IMPELLER FAN, shown here in cutaway on two-wheeled Vespa, cools the engine, which develops six horsepower. Ignition is by magneto. Station wagon also has a battery for lights.

SPARE WHEEL is toted much as in all station wagons. Vehicle license in states charging on weight basis is $5 to $10. Wheelbase is 65 inches, width 50 inches, length 82 inches.



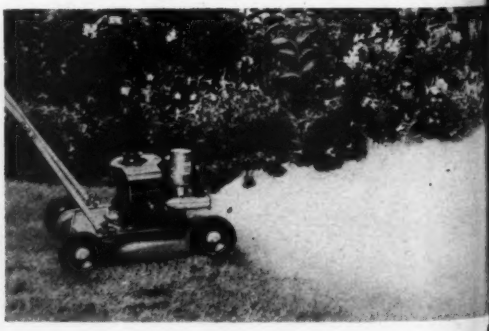
New Aids to Living

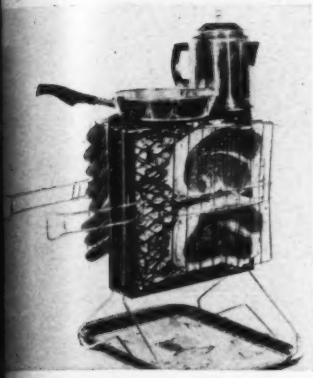
1 Two-wheel pushcart totes such loads as wet wash, garbage cans and heavy garden sprayers. Riding on broad, rubber-tired wheels, the light cart is easily managed by a single-grip handle of aluminum tubing.

2 Outdoor lift, for hillside homes and vacation cottages built on steep slopes, rides on steel rails that are available for various distances and grades. You can seat two or more in the car, which is pulled up and lowered by a cable-winding drum machine operated by an electric motor. It has safety devices like those on elevators.

3 Traveling-case radio, in top-grain cowhide styled for outdoor or indoor use, operates three ways: AC, DC or battery. With its built-in antenna, say the makers, you can bring in stations even in difficult-reception areas. Civil Defense broadcast frequencies are marked.

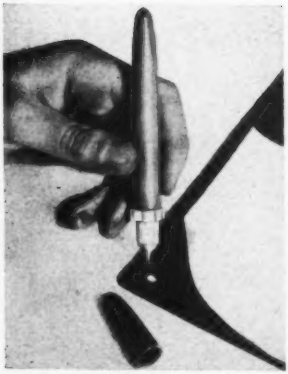
4 Power-mower sprayer rids the average back yard of mosquitoes, gnats and other insects in 10 minutes, according to the manufacturer. The attachment can be installed on most power mowers. It fogs through a muffler, which also acts to quiet the exhaust when you cut grass.





5 Stand-up broiler, with two pounds of charcoal inside, can broil four steaks, 40 hot dogs or 18 hamburgers at once, and also cook on its top. You can lay it on pull-out side legs for use as a camp stove.

6 Toaster warmer keeps hot breads hot at the table. Sliding prongs fit into the corners of the toaster slots and are adjustable for most pop-up electric toasters. The tray is made of perforated steel.



7 Adhesive applicator that resembles a ball-point pen dispenses dots of rubber cement when you press down on its point. The capacity of the barrel is about 5,000 dots. Refill cartridges are available.

8 Non-choking dog collar is made with a spring-steel bulge at the front to fit over a pet's windpipe so that pressure is applied only to the muscles at the side of its neck. A running ring at the back of the collar compensates for size adjustments and keeps the leash in a direct line with the U-shaped insert.

9 Light intensifier clips on an electric bulb and directs a concentrated beam where you want it for reading, doing close work or assembling small parts. It consists of a specially designed lens in a metal casing fitted with spring clips that clamp firmly on the end or side of a standard household lamp.

More information *about the products shown on these pages can be obtained from: 1. Hoke Tool Works, Raeford, N.C.; 2. Sedgwick Machine Works, 153 W. 15th St., New York City 11; 3. Zenith Radio Corp., 6001 W. Dickens Ave., Chicago 39; 4. Donaldson Co., 680 Pelham Blvd., St. Paul 4, Minn.; 5. Lakewood Mfg. Co., 25039 Center Ridge Rd., Westlake, Ohio; 6. Trude Mfg. Co., 3821 S. Racine Ave., Chicago 9; 7. Poppet Corp., 8707 Hudson Blvd., North Bergen, N.J.; 8. William C. Driscoll, 16 Lotus Rd., New Rochelle, N.Y.; 9. Frances Murray, R.R. 3, Bloomington, Ill.*

"Here, gentlemen, is the secret. Why make the mechanics rich?"

Gus Baits

By Martin Bunn

"I WANT to give my car a pill," said the seedy little man, adjusting his pince-nez glasses and fixing Gus with a glittering, if watery, eye. "Be so good as to let me have a pint of gasoline to wash it down with."

Gus took in the customer and his small '49 car at one glance. One was as pompous as the other was ordinary.

"I don't know much about giving pills," he said easily. "What are they for?"

"They improve the gasoline mileage by 200 percent." He showed Gus a bottle containing small red pills. On the outside was printed "GAS-O-MORE—ADDS MILES TO YOUR MILEAGE."

"Take my advice, mister, and don't use them," Gus told him. "If you aren't getting good mileage, you probably need a tune-up."

The man took off his glasses and let them hang by the long black ribbon around his neck. "I figured you'd say something like that. You mechanics are all the same. Want to get your hands on a man's car. Expensive tune-ups. Not me. I do all my own work. I'll put you fellows out of business one of these days."

Gus couldn't help being amused. "How?"

The little man returned the pills carefully to a suitcase on the front seat. Then he handed Gus a business card which read: "Philo Dittington, Mr. Do-It-Yourself, Author, Lecturer."

"Why, sure!" Gus exclaimed. "You're going to talk at the Business and Pro-

"Mr. Do-It-Yourself is a fake —and he'll prove it."

s a Trap

fessional Men's Luncheon Club this noon." He extended his hand. "Let me be the first to welcome you to our town."

Mr. Dittington put a small, paper-bound book into Gus's outstretched hand. "This is my book on servicing your own car. It's called: *Be Your Own Mechanic.* Only a dollar. Might give you some pointers."

Gus laughed. "I'll wait until after the lecture to do my homework. I'll see you this noon." Philo Dittington got into his car and stepped on the starter. The engine ground over and over with a tired whine before finally catching.

"Wouldn't be surprised if your car needed a little attention," Gus said. "Maybe the plugs or points."

"I know," retorted Dittington. "It's the points. I happen to have a new set in the glove compartment. But you're not going to get the job. Right after my lecture, the president of your club is going to put them in for me."

"Fred Pettigrew?" Gus exclaimed. "He's a dentist. What he knows about engines wouldn't fill the reverse side of a postage stamp. I take care of all the work on his car."

PHILO DITTINGTON smiled smugly. "Don't worry, my good man. Each of my lectures ends with just such a demonstration. With the aid of my principles of self-help, Dr. Pettigrew will successfully install a set of points in my car. Come and see for yourself."

"The points in the car now," Gus inquired. "Did you put them in yourself?"

"No, sir. Just bought this car. Second-

hand. No sense in buying new cars when with my book I can fix anything that goes wrong. Good day, sir."

GUS arrived at the Community House at a quarter of twelve. Most of the membership of the Business and Professional Men's Luncheon Club was on hand. And already word had gotten around that their president, Fred Pettigrew, was going to install a new set of points in the speaker's car.

Jack Bishop took Gus aside. "Is this guy nuts?" he demanded. "Imagine letting Fred Pettigrew get under the hood of a car! Shouldn't we warn Dittington?"

Gus stroked his chin thoughtfully. "I'm more inclined to think we ought to warn Fred. I have a hunch that this Mr. Philo Dittington is an outright fake."

Bishop stared. "How come?"

"Just suppose Fred does succeed in installing those points, don't you suppose that most of the people here will buy a copy of Dittington's book? And that this Dittington will tell the whole town that the club's endorsed him? He's carrying some pills that are supposed to extend gas mileage. I figure he'll try to sell those at a fancy price, too. They're strictly n.g."

"Shouldn't we blow the whistle on him?" Bishop said indignantly. "I'm going to speak to Fred right now."

Gus held out a restraining hand. "Not now. It wouldn't do any good. I have no proof of any kind. We have to let the guy expose himself. Otherwise he'll say I'm persecuting him just because I'm scared that he'll hurt my garage business."

"But how can we get him to expose himself?"

Gus chuckled. "My hunch is that he's already set his own trap. I'll bait it, and I think we can watch him spring it himself. Just don't be surprised at anything I say or do in the next hour or so." He winked at Jack and moved off to the dining room.

WHEN the meal was over, Fred Pettigrew gave Philo Dittington a splendid introduction, which he read from a sheet of paper that Dittington had been thoughtful enough to supply. Dittington then arose and launched into a smooth, flowery dissertation on the merits of Do-It-Yourself as exemplified in the Ten Dittington Commandments of Self-Help. There was something reminiscent to Gus of the pitch of the old-time snake-oil salesmen. Dittington laced his talk with references to his handbook.

"Here, gentlemen," he told them dramatically, "is the secret of Do-It-Yourself. Why make the mechanics rich?"

Just to show them how simple it all was, he went on, he had prevailed upon Dr. Pettigrew, a distinguished member of the dental profession, to give them all a demonstration. When the applause had died down and the meeting was about to move outside, Gus got to his feet.

"Can I have your attention for a moment?" The room quieted down. "I want you all to know that the Model Garage stands behind this demonstration 100 percent."

Cries of "Good for you, Gus!" and "You're a real sport, Gus!"

Gus continued, "You all know I make a living servicing other people's cars. Just the same, I think the more people know about how to take care of their own cars, the better. If Mr. Dittington's book does what he says it does, you will all be better off for buying it. If it doesn't, you can get your money back at the Model Garage."

Again there was applause, and the

[Continued on page 220]

This solid, roomy barbecue table lets you eat outdoors in comfort. Like to make it? Turn the page

How to Build Your Own Garden Furniture

By Paul Corey and Darrell Huff

Here's a patio chair designed for lazy cat naps in the sun. Add wheels and arms if you like

SAW OUT CIRCULAR TABLE after nailing pieces together with temporary cleats. If you're working alone, draw 56" circle with temporary cleats in place and cut each board out. Reassemble with permanent two-by-two cleats.

Patio Table Seats Eight

BARBECUES and back-yard picnics call for lots of seating capacity—the smell of charcoal broiling draws friends from all directions. This roomy table provides comfortable places for eight, and by squeezing in a few chairs between the built-in seats, 12 people can sit down.

Pine, fir or redwood are suitable for making the table. Dimensions have been worked out to fit standard board lengths, and you will barely have enough material left to make toothpicks for your guests. Hand-pick your boards for good, clear grain. Here's what you need:

Three two-by-eights; two 8′ long and one 14′ long, for the table top.

One two-by-twelve 14′ long for seats.

One two-by-six 14′ long for the legs.

Two two-by-fours 14′ long for seat supports.

Two two-by-twos 12′ long for cleats.

Thirty-two carriage bolts, ⅜″ by 6″, with washers.

Eight screen-door braces 42″ long.

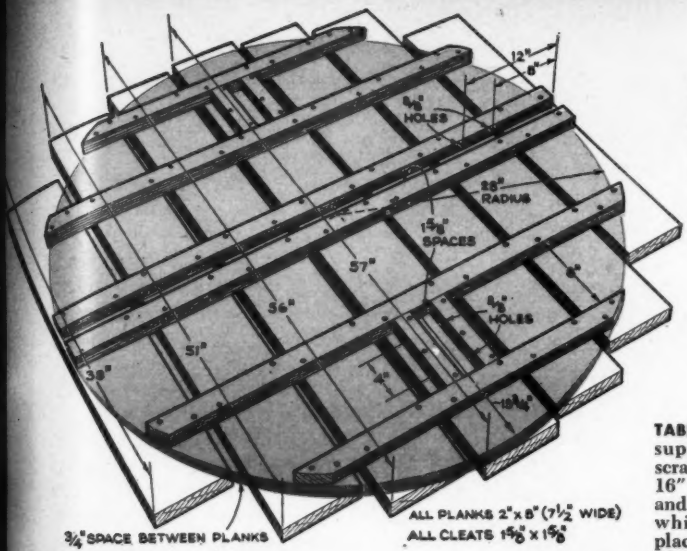
Eighty-eight flathead galvanized wood screws, 2½″-12.

Lay out all cuts on the two-by-eight boards and check them before cutting to see that you'll get all the pieces you need. From each of the 8′ lengths, cut one 56″ piece and one 38″ piece. From the 14′ length, cut two 51″ pieces and one 57″.

Spacing the boards. Arrange the pieces on the floor so that the outer edges of the two short pieces are 57″ apart. Then fill in the remaining five pieces so that they are evenly spaced. There should be a ¾″ space between each piece, but if your lumber has shrunk below the standard 7½″ width, compensate for it so that you'll get a full 56″-diameter table.

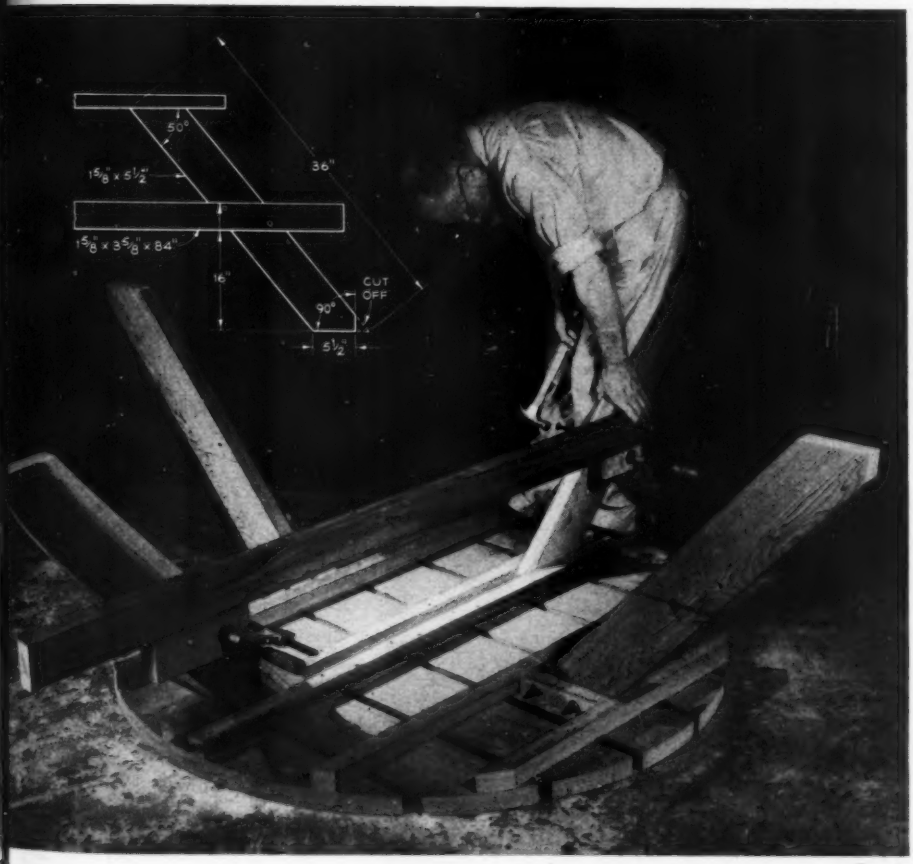
Nail temporary cleats across the pieces and draw a 28″ radius from the center of the center piece. Saw out the circle and smooth the edge with a plane or rasp.

Cut the two-by-two into cleats to fit across the boards and fasten them in place with waterproof glue and screws. Cut four 8″ cleats and fasten them to the center piece as shown. Bore ⅜″ holes 8″ and 12″ from the ends of the two center cleats before fastening them in place. Bore holes in the 8″ cleats 2″ from each end. Space these cleats 1⅝″ apart

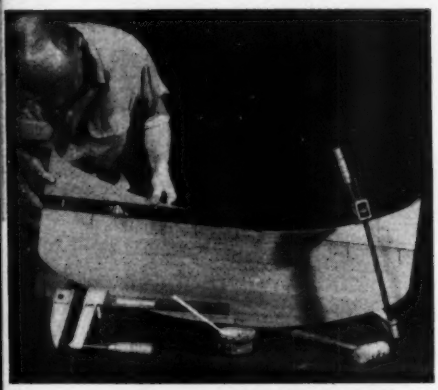


ARRANGE PIECES on flat surface after cutting to specified lengths. Spacing between boards should be about ¾", but depends on actual width of boards. Glue and screw cleats in place after cutting.

TABLE CROSS BRACES also support the seats. Clamp scrap blocks on a line drawn 16" from bottoms of legs and rest braces on them while fastening them in place. Note how the outer tip of each leg is cut 90°.



CUT DOUBLE NOTCHES in the centers of all cross braces so that they'll fit flush when crossed over. Drill ⅜" holes vertically through the braces, 2" and 9" from ends, for the seats.



CUT OUTER EDGE of each seat to 42" radius and save sawed-off pieces. Drill them for ⅜" dowels and glue them to inner edge to make a curved seat. Sand all the edges round.

so that the table legs will fit snugly between them.

Legs. Cut four 36" pieces for the legs out of the 14' length of two-by-six and trim both ends of each leg to a 50° angle. Cut a corner off the bottom of each to eliminate the long, sharp edge. Bore the top of each leg to match the holes in the cleats and bolt them in place.

Cut the two-by-fours into 84" lengths and cut a double notch in the center of each so that they will overlap when installed. Clamp the first pair to two opposite table legs 16" up from the bottom. Bore two holes through legs and two-by-fours and bolt them together. Secure the second pair of crossbars in the same way.

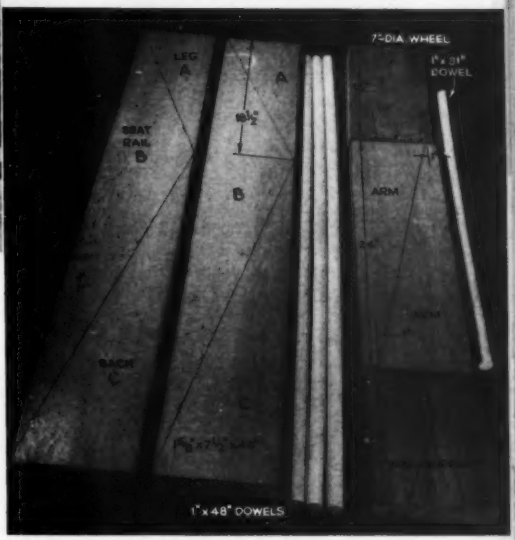
Curved seats. Make the seats from four 42" pieces of two-by-twelve cut from the 14' board. Draw a 42"-radius curve near the edge of each piece and saw along the line. Save the pieces that drop off, drill them for ⅜" dowels and glue them to the opposite side to create a curved seat that will blend with (but not match) the radius of the table.

Bolt the seats to the table supports and brace the table with eight 42" screen-door braces. Tighten them until the table is rigid.

Sand the table thoroughly, taking care to remove sharp corners. Stain the wood or finish natural with varnish or other clear exterior finish.

BOLT SEATS to ends of the cross braces. Attach screen-door braces from the center of each seat to the tops of the legs at right and left of it. Taking up on wire braces keeps table from swaying.

This Easy Chair Is Easy to Build

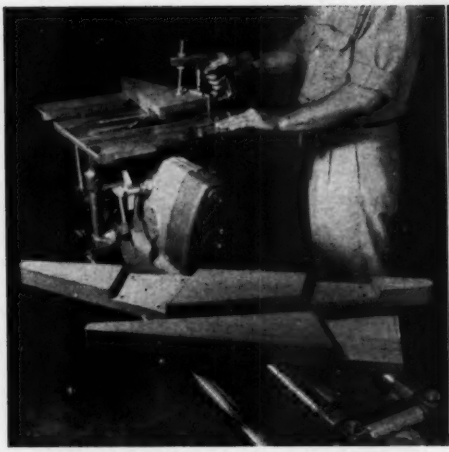


EVER start a project and wish you could stop before you'd finished? Here's one that'll let you. Build the basic chair and stop if you like . . . or go on to add arms to the chair. Again, stop . . . or carry the job to final completion by adding wheels and a dowel axle. No matter where you stop, it's an all-weather patio chair. A mail-order club-chair pad (22½" by 47") makes it an attractive upholstered piece of furniture on those cloudless, sunny days. Whisk the pad indoors when it looks as though a storm is brewing and it's still a good-looking patio chair—and comfortable, too, even without the pad to sit on.

What you need. For the basic chair, buy two 4′ lengths of two-by-eight, three 1″ dowels 48″ long, 28 wood screws No. 1½″-8, and 100 feet of plastic clothesline. To add arms to the chair, increase your order by two additional pieces of two-by-eight—one 9″ long and one 24″ long—four 2″-12 flathead screws, and four ¼″ carriage bolts—two 3½″ long and two 4½″ long. Adding wheels requires 15″ more of the two-by-eight, another 1″ dowel

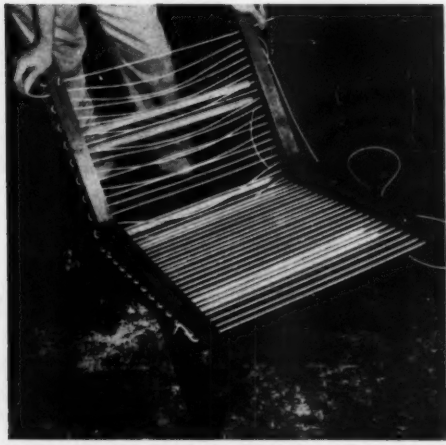
TWO BOARDS at left and three dowels make the basic chair. The other parts are optional for wheels and arms. Simple cuts make shaped parts.

ARRANGE PIECES to make one right- and one left-hand assembly. Place leg 5″ from front of chair rail (shown being measured). Place the backrest so that its front edge is even with the vertex of the chair-rail triangle. Mark the joints.



CUT HALF-LAP JOINTS in legs, backrests and rails, removing wood to exactly half the thickness of the stock. Drill four 1/8" holes in each joint of the chair rails for wood screws.

ASSEMBLE THE TWO SIDES, using screws and water-resistant glue. Screwheads should be countersunk, but need not be concealed as the screws are inside when sides are placed together.



STRING THE CHAIR with plastic clothesline, beginning at the front of the seat. Pull the line tight as you go. Take a final pull on it before securing by threading under the loops.

TO ADD WHEELS, bore 1" holes through the legs 2" up from bottom ends. The 7" wheels are roughed from two-by-eight stock, disk-sanded round, and bored 1" for the dowel axle.

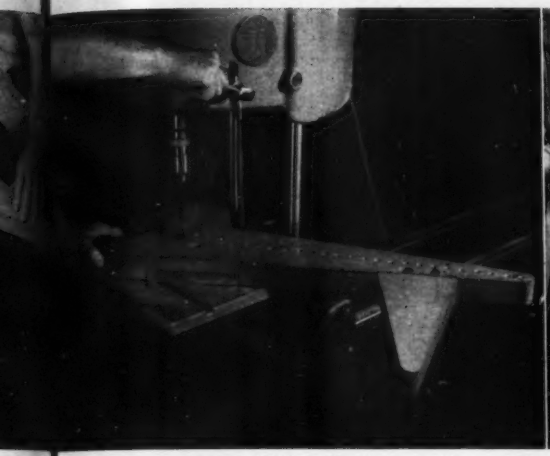
31" long, and a short 4" piece of 1/4" dowel.

The basic pieces. Building the chair is an ABC job. Measure 18½" from a corner of each of the 4' lengths of two-by-eight and draw lines from that point out to the two corners on the opposite side of each board, laying out a long lopsided V.

Cut on this line to make three pieces marked A, B and C out of each board. Plane these pieces smooth, then match them against each other for shape, and round off all sharp points.

Arrange each ABC set to form one side of the chair and mark the meeting surfaces for cutting half-lap joints. Cut the joints, drill pilot holes for the screws and the parts are ready to assemble.

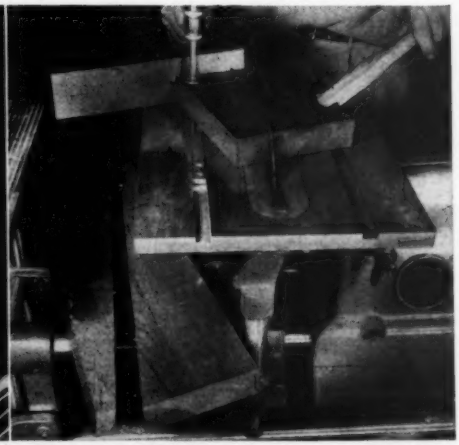
Cord and bracing. Draw lines down



DRILL ROWS of ¼" holes 1" apart for cord in rail and backrest. It may be easier to clamp frames together and drill both at once. Holes for dowel cross braces are bored 1" deep.

ASSEMBLE CHAIR with six 1" dowels, 24" long. Use glue, and drive screws through screw holes drilled in centers of the dowel holes. Sand the frame down smooth and then varnish it.

HOLD WHEELS ON AXLE with short pieces of ¼" dowel driven into holes drilled near the ends of the dowel. Dowel for axle is 31" long. Varnish the axle, then wax for easy rolling.



ARMS make the chair complete. Cut them from a 24" piece of two-by-eight. Make the supports from a 9" piece. A diagonal cut, as above, produces two matching pieces from each board.

the center of each backrest and rail. Beginning where the lines meet (just above the rear leg), drill ¼" holes for the cord. Place one assembly with screwheads up and bore three pairs of 1" holes, 1" deep and 2" apart for the cross braces. Drill ⅛" pilot holes for screws in the center of each of these holes. Then place this assembly on the other one so that the screwheads are together. Insert a pencil through the pilot holes and mark the matching locations of the 1" holes in the opposite assembly. Similarly, bore this assembly for cross braces, and drill pilot holes. Cut the 1" dowels into 24" lengths and use them to join together the two side frames.

Thread plastic clothesline through the ¼" holes in the sides, starting at the front edge of the seat. Drop in a standard 22½"-

DADO IN ARM fits over the support. Glue and flathead wood screws join the parts. Countersink the screwheads deep and conceal them with plugs or cover them up with wood putty.

BOLT ARMS TO SIDES. Drill ¼" holes for carriage bolts 1" in from the narrow ends of both arms and supports. Position the arm, drill matching holes in each side and insert bolts.

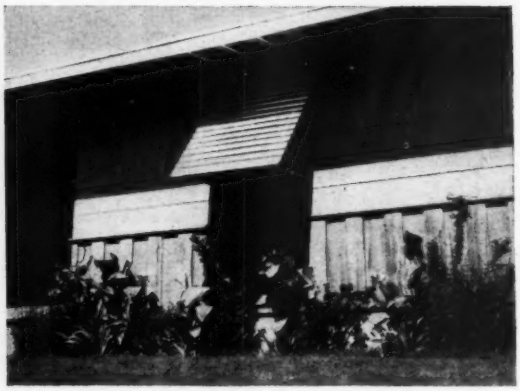
by-47" club-chair pad or make your own pad by covering foam rubber with fabric or plastic.

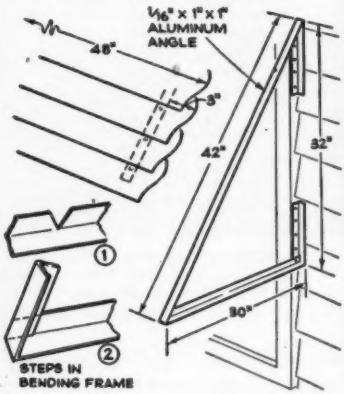
Instead of dragging your chair out onto the patio, you could roll it out. How? Make your own wheels and pin them to a dowel axle, as shown in the photos on pages 150 and 151.

How to add arms. If your elbows are lost without something to lean on, arms on your chair will put them at ease. Cut the pieces from two-by-eight. A dado, ½" by 1⅝", across the bottom of each arm 4" from the broad end fits the arm over the top of the support.

After the arms and the supports have been assembled, attach them to your new patio chair with carriage bolts. END

Louvered Awnings of Corrugated Aluminum Dress Up House





AWNINGS that shut out hot sun and let breezes in are a cinch with do-it-yourself aluminum. One 4'-by-8' corrugated sheet and four 8' lengths of aluminum angle will shade two windows.

Bend the angles for frames, as shown in the drawing, and screw one to each side of the window casings. Then saw the sheets into strips of 1½ corrugations each (a circular saw does it quickly).

Attach the strips to the frames with sheet-metal screws. Begin at the bottom and space them to admit air without sunlight.—*Edwin F. Thomas, Fort Worth.*

How to Make an Old Fan Look New

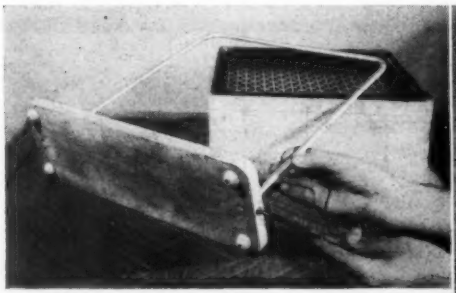
DRAGGING out that old fan this summer will probably remind you that the newer ones look a lot nicer, channel the breezes better and are safer to handle. You can make one of these handsome modern types by hiding the motor and blades of the old fan in a simply made tilting case of wood.

First strip down the old fan, discarding its base, oscillating mechanism and blade guard. Saw off any excess shaft at the back of the motor to reduce the cabinet depth required.

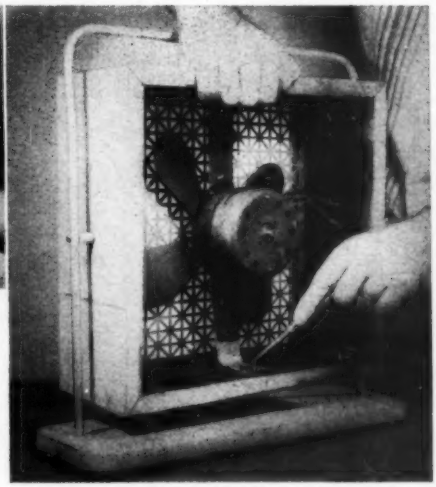
The case is ¾″ pine, its inside dimensions 1″ bigger than the fan-blade diameter and 2″ deeper than the depth of motor plus shaft. Rip a groove ¼″ deep in the sides, 1″ back from one edge, for the aluminum grille to slide into. The joints are mitered and fastened with nails and glue. A metal strap holds the fan.

The case is suspended from a bent ⅜″ aluminum rod that also forms a carrying handle. Stove bolts connect the case and rod, running through spacers of tubing or drilled dowel. Lock washers inside the case provide tension to keep the case tilted at any angle.

The rod fits into a ¾″ pine base that is 3″ longer than the case and as wide as the case is deep.—*Ronald L. Anderson.*



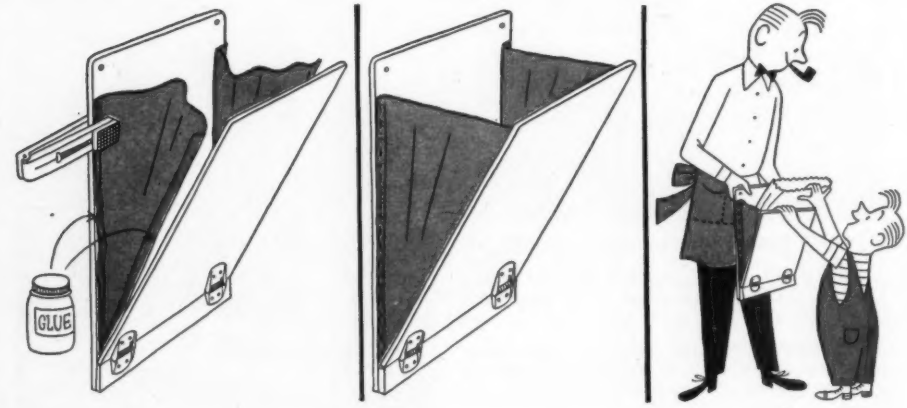
U-SHAPED ROD serves as frame and handle for modernized fan. Ends go in holes drilled through base and are anchored with wood screws from the side. Base has dime-store rubber feet.

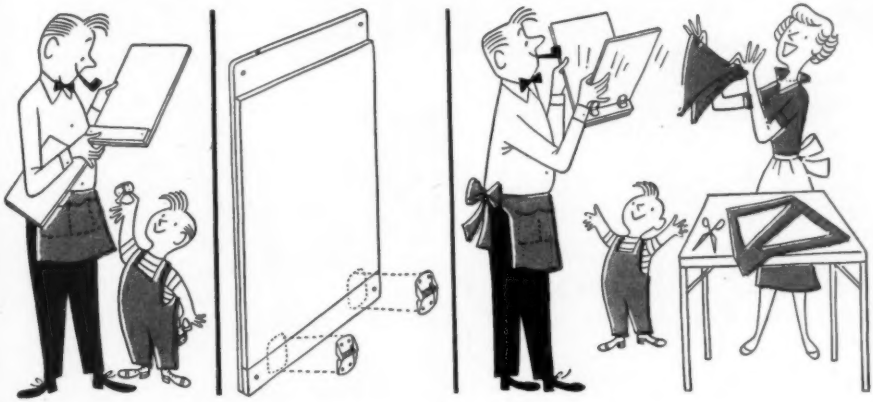


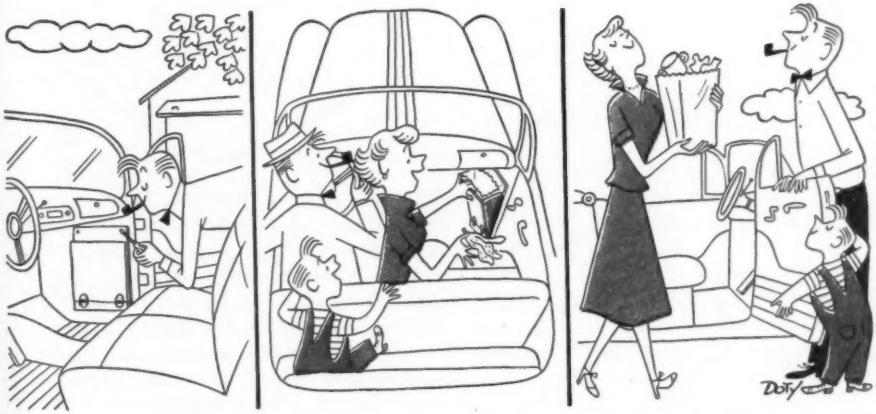
METAL SUPPORT STRAP, drilled to take motor studs and slotted to clear the shaft, is screwed into case (right). Paint motor and inside of case before assembly, and tack on a rear grille.

By Roy Doty

Wordless Workshop







Next Month: A double-decker bunk bed for a pair of pets

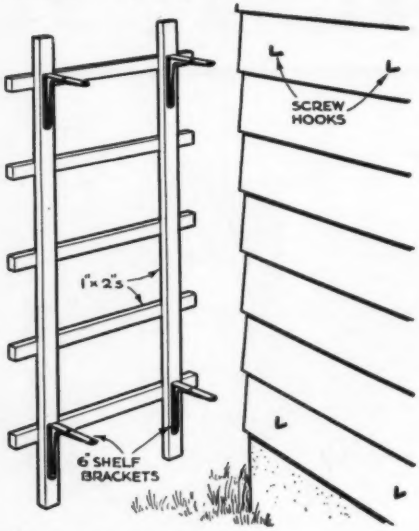
Handsome Walk Is Made of Different-Colored Cinder Blocks

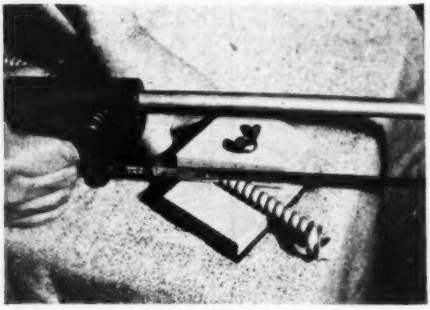
A VARICOLORED walk of half-thick cinder block rivals flagstone. The blocks come in pink and two shades of gray and are 4″ thick by 8″ by 16″ on a side.

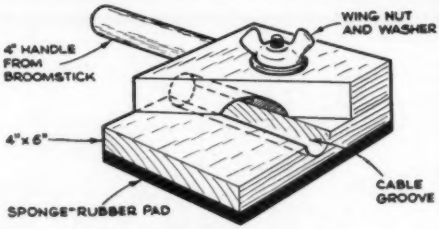
Place the non-skid blocks on a 1″ layer of well-tamped sand. You can keep them in a straight line by stretching a string along one edge. Use a regular color pattern for best effect.—*David X. Manners, Norwalk, Conn.*

Trellis Lifts Off for Paint Job

VINES are pretty climbing up a house, but they get in the way of periodic house painting. To have your vine and an easy paint job, too, make a detachable trellis. Shelf brackets on the trellis fit screw hooks in the house siding. When painting time comes, you can simply detach the trellis and lay it on the lawn.—*G. E. Hendrickson, Argyle, Wis.*



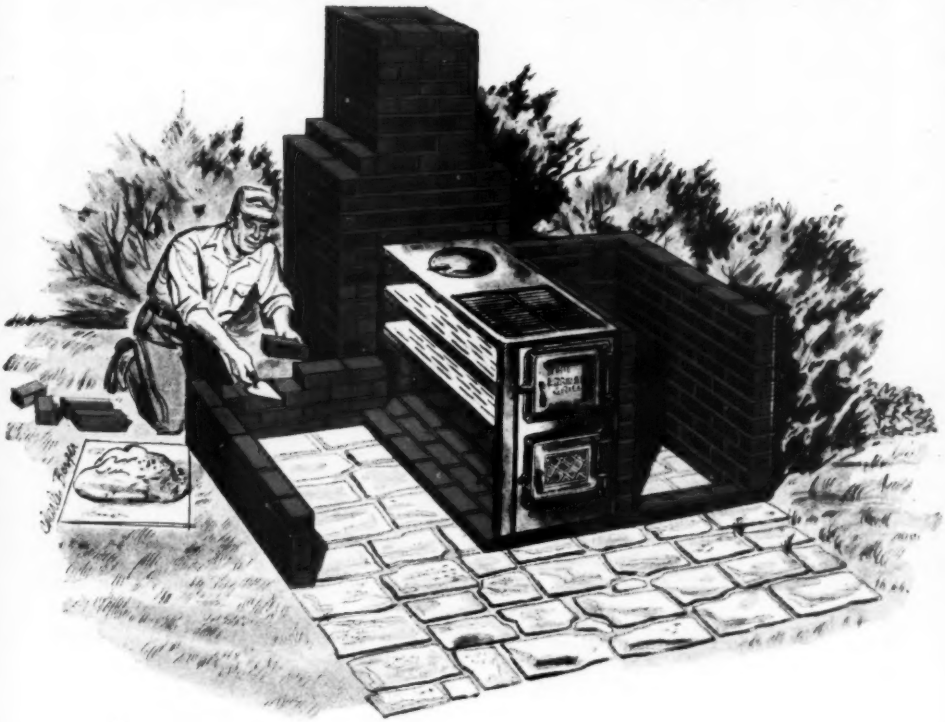




Saw Clamp Steadies BX

Armored cable will hold still for your hacksaw if it's clamped between two blocks. Cut the top block on a bias at right angles to the loops of sheathing. Groove both blocks to hold the cable, using a router bit or file. The broomstick handle fits into a blind hole in the bottom.—*Robert Lemp, Sayville, N. Y.*

Prefab Fireboxes Make Barbecue Building Easy



By Sheldon M. Gallager

BACK-YARD barbecue builders are getting a whole new crop of prefab aids to make the job go faster.

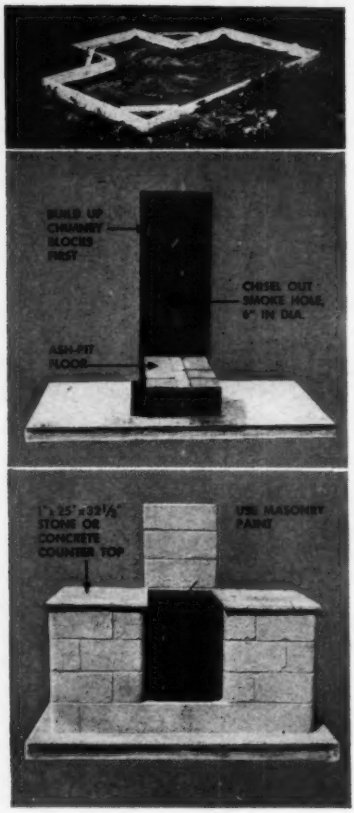
These are ready-made grills and fireboxes that you surround with simple masonry enclosures to turn them into fully operating outdoor fireplaces. You can buy a prefab unit, complete with adjustable grates, a fire door and an ash-pit door, for as little as $30.

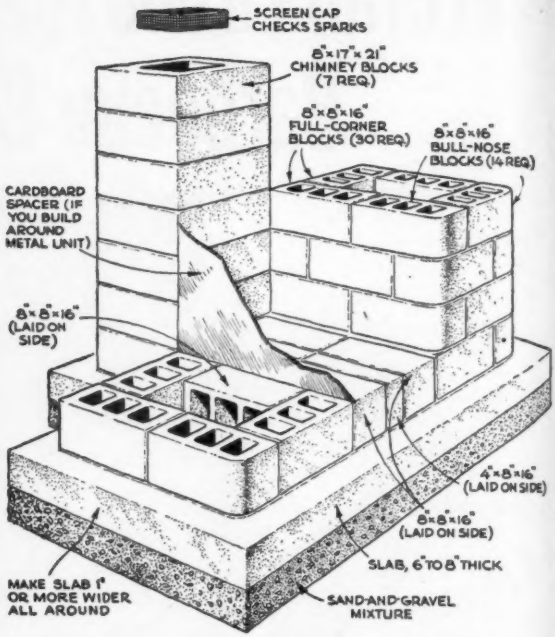
Most models can be slipped out of the masonry enclosure, knocked down to a car-trunk fit, and carried with you. For temporary use, they work well without an enclosure. In winter, you can store them indoors to prevent rusting and weathering. In addition to open grills, you can get such frills as a Dutch oven for boiling and baking, griddles, surface-cooking tops, even an incinerator.

Setting it up. The metal unit comes disassembled and can be bolted together, ready for use, in a few minutes. The kind of masonry you surround it with depends only on your taste, skill and time.

Before you mix up the mortar, it's a

Concrete blocks plus firebox make a neat and simple barbecue





BLOCK ENCLOSURE starts with slab, for which one-by-eight form boards are set above sub-base (top left photo). Chimney, of standard square "doughnut" blocks, is built up next. Blocks on their sides form ash-pit floor. Slate or concrete slabs make "counters." This barbecue, designed for Majestic firebox, can often be bought as a package that includes both the metal unit and masonry materials.

good idea to pile the blocks or stones loosely around the firebox and test-run through a couple of steaks to see how you like it.

Location. For the sake of your neighbors and guests, try to place your fireplace so that it doesn't spew smoke either at you or at the house next door.

The best spot is on high ground with the front facing in the direction of prevailing winds to provide good draft and carry the smoke up and away. Keep the grill away from valuable trees, as the heat may eventually kill them.

The slab. Because the foundation is relatively small, you can "float" it on a bed of sand and cinders, instead of on deep footings. The slab will rise and fall slightly without harm.

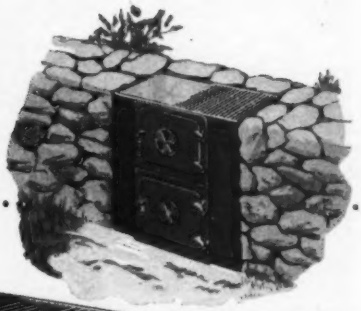
Lay out the slab 1″ wider than the fireplace, allowing for ½″ mortar joints between your blocks. Dig a pit about 10″ deep and fill the bottom 6″ with sand and gravel mixed together. Set form boards so that the slab will project 2″ to 3″ above ground level.

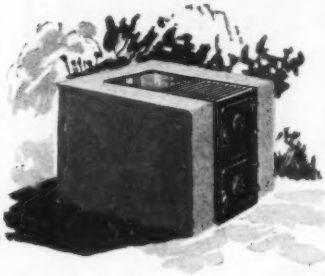
Mix the concrete no leaner than one part cement, 2½ parts clean sand and four parts gravel. Pour 3″ or 4″ of concrete, then lay in the reinforcing mesh—10-gauge wire or even old fencing. Pour the remaining 3″ or 4″ of concrete and tamp firmly around the wire, but *don't* push the wire down—it must remain suspended about midway. Let the slab dry under wet burlap for at least two days before building on top of it.

Laying the blocks. Most fireboxes are

Pick a prefab to suit your space and cooking needs

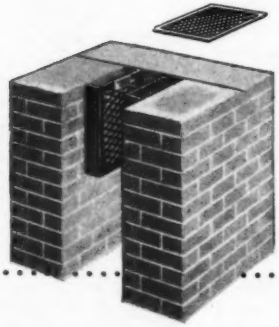
SHALLOW FIREBOX is designed to fit into a garden wall. This model has a removable top in two sections so that you can use it as double grill, double solid top, or combination of both.

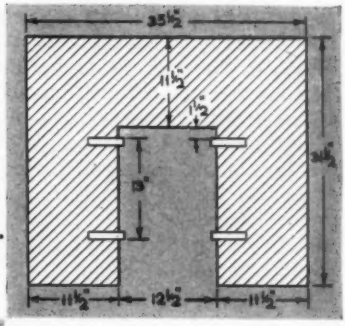


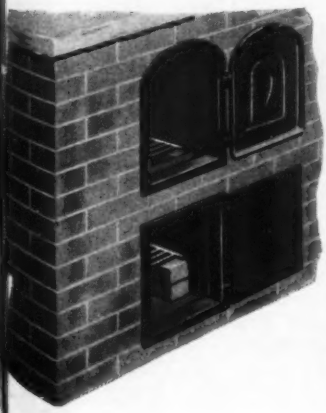


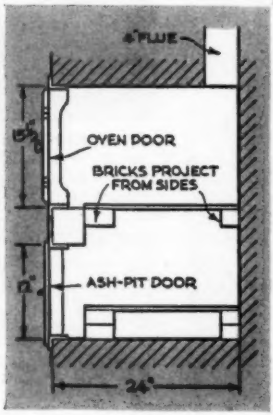
NARROW FIREBOX is meant for free-standing barbecue, needs only a little space. It offers same cooking area as shallow wall type. Upper door is for fire, lower door for the ash pit.

VERTICAL FIREBOX cooks both sides of meat suspended inside it, and prevents grease from dripping into fire. This Donley unit is removable, hanging on hooks embedded in masonry.



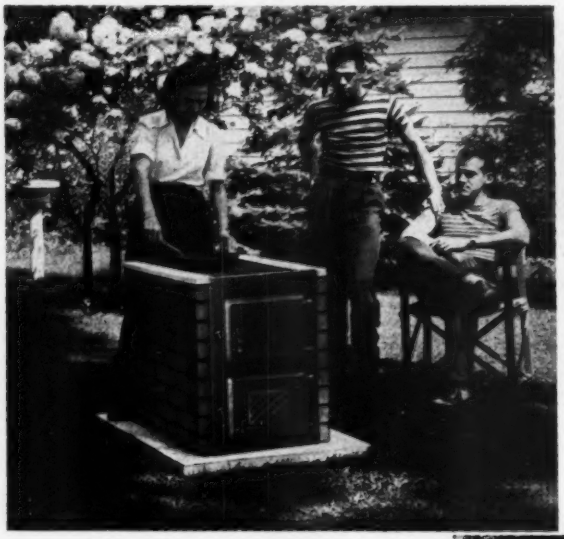






DUTCH OVEN consists of two separate self-framed metal doors that are cemented into a hollow opening in the masonry. To support upper grate, the masonry is constructed with a ledge of brick projecting slightly inward on each side. The fire is laid on the lower grate, which is blocked up on bricks at the corners.

Fancy layouts, simple grills, start with built-in fireboxes



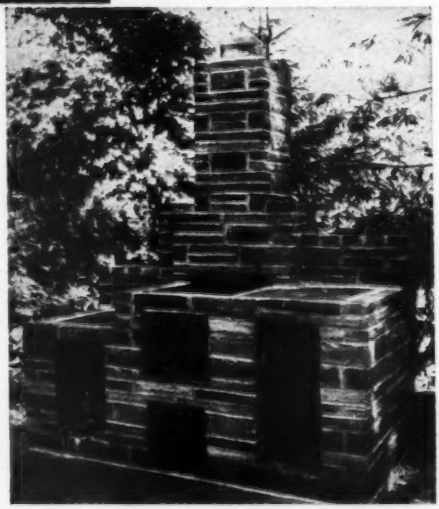
FOR CHARCOAL COOKING, an enclosure of firebrick—one brick thick, without a chimney—was built around this Homer firebox.

designed to fit within standard blocks and bricks so that you don't have to do any cutting. Some are tall enough to stand directly on the concrete slab; others must be blocked up to a comfortable work-surface height (30″ to 32″). This is another good reason for laying out the blocks loosely—it gives you a chance to see how many rows you'll need.

You use the firebox as a form and build the enclosure around it—but not mortared directly to it. Set sheets of corrugated cardboard against the metal sides and build the masonry against these. The fire will burn the spacers away, leaving a gap so that the metal can expand.

If your firebox has open sides, you may want to enclose it with fire bricks. Set them edgewise for a lining, flatwise for a single-wall enclosure. Use special fireclay mortar, not regular cement, and keep the joints extra thin—about 1/16″. A firebrick lining is a must if you build with either limestone or sandstone, as these crack easily under heat.

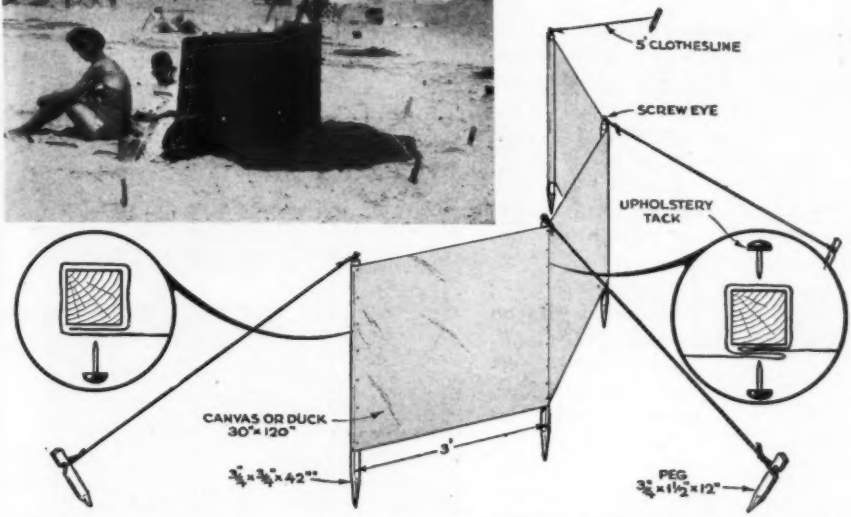
A chimney? If you're strictly a charcoal cook, you won't need one, but be sure that the grill you buy has adjustable grates. You need a high grate position for charcoal, a low one for wood. For burning logs, a chimney is usually required to increase draft and channel away the heavier smoke. END



BIG BARBECUE includes storage niches and a special firebox. This one, made by Outdoor Fireplace & Equipment Corp., has a removable crank handle to raise or lower the fire grate.

More information *about barbecue fireboxes can be obtained from: Colonial Fireplace Co., 540 N. Cicero Ave., Chicago 44; Donley Brothers Co., 13902 Miles Ave., Cleveland 5; Homer Foundry Corp., Coldwater, Mich.; Majestic Co., Inc., 115 Erie St., Huntington, Ind.; Outdoor Fireplace & Equipment Corp., 347 Monroe Ave., Kenilworth, N. J.; Outdoor Oven Fireplace Co., 872 Windsor St., Hartford 1, Conn.*

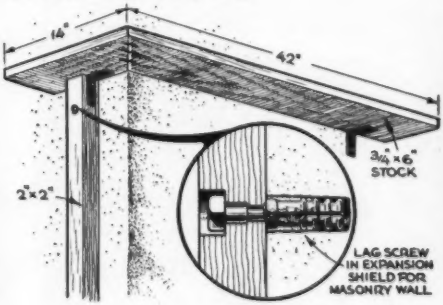
Beach Windbreak Is Made of Canvas

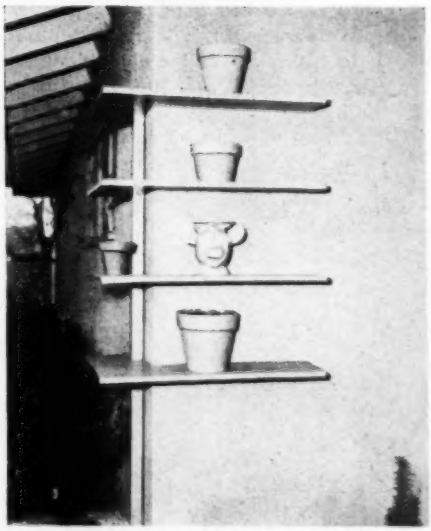


SAND will not beat against your sunburn or get into the food when you take a canvas windbreak to the beach. Mine is a 9′ length of 30″ awning canvas tacked to four stakes. Four pieces of light clothesline, running from screw eyes at the top of the stakes to notched pegs driven into the sand, anchor the shield. I sanded and shellacked the stakes and pegs.—*John G. Voelker, Towson, Md.*

Bric-a-brac Shelves Dress Up Outside Corner of Garage

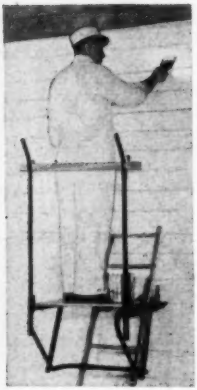
A BARE corner of your house or garage will take on interest if you add shelves like those at right to hold potted plants and bric-a-brac. Attach a vertical support to one wall with spikes (or lag screws, using a star drill, if it is masonry) and hang shelves from it with angle brackets. Use spikes or brackets also to hold the shelves to the other wall.





New for the Handyman

1. Drain Is Connected Quickly. Lightweight plastic pipe for house-to-septic-tank connections and other drainage jobs is installed quickly with brushed-on cement and a special coupling. The pipe can be cut with a saw. It comes in 10′ lengths and 2″ to 6″ diameters. A dividing ridge on the inside of the coupling helps you to center the pipe in the joint for a permanent seal.



2. Scaffold Fits on Ladder. This aluminum scaffold, attached to a ladder, gives you an elevated platform for house painting. Nonslip clamps grip the ladder, and a guard rail keeps you from backing off. The unit can also be set on a window sill. It is capable of supporting a heavy weight.

3. Kit Starts Garden Machines. Any tractor, lawn mower or other equipment with a 1- to 12-hp. air-cooled engine can be converted to electric self-starting with a new unit. The kit includes a six-volt battery, starting motor, switch and necessary parts for quick installation.

4. Scriber Marks Linoleum. This scriber—a metal support holding a marking crayon—walks around obstructions so that you can accurately measure and trim new floor covering. It adjusts for drawing circles from 1″ to 25″ in diameter.

More information *about the products described on this page can be obtained from: 1. Carlon Products Corp., 10225 Meech Ave., Cleveland 5; 2. Portable Scaffold Co., 342 Taylor Ave., S. Hackensack, N.J.; 3. Chief Industries, Dowagiac, Mich.; 4. Charles Machine Co., P.O. Box 63-131, Springfield, N.J.; 5. Max Salisbury Mfg. Co., 2036 Reidmiller Ave., Fort Wayne, Ind.*

5. Bracket Holds Screens. With this hook-on bracket you can use your ladder as an easel for painting or repairing screens and windows. The metal device has two fingers that grip a ladder step.

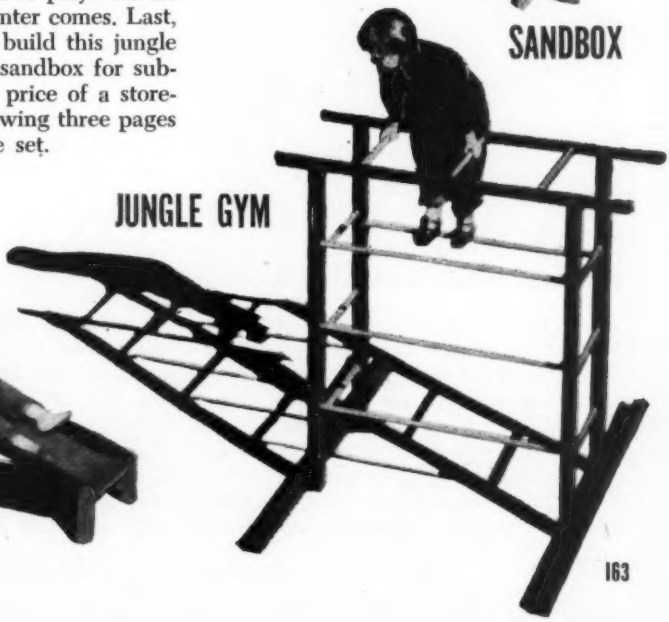
SWING

Play Equipment That You Can Build

By Charles and Marion Schroeder

HERE'S a sturdy set of back-yard play equipment scaled for little folk from the toddler age up through early school years. Each piece is low enough to minimize danger from falls. Any of them may be taken indoors and used in a basement or playroom on rainy days, or when winter comes. Last, but not least, you can build this jungle gym, slide, swing and sandbox for substantially less than the price of a store-bought outfit. The following three pages show how to make the set.

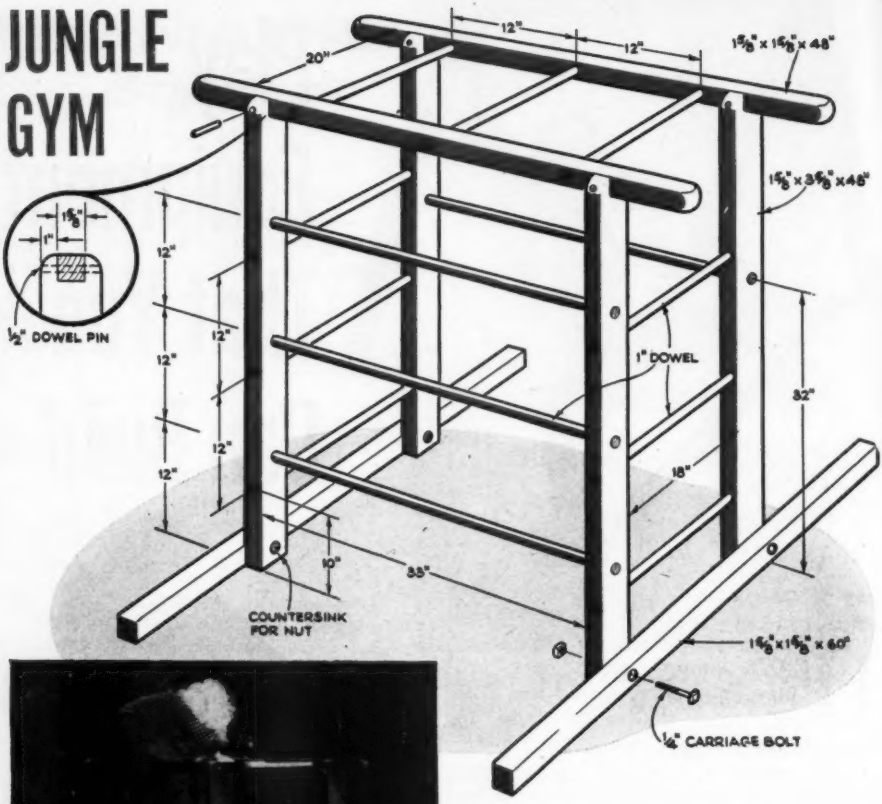
SANDBOX



JUNGLE GYM

SLIDE

JUNGLE GYM



ALWAYS a favorite with youngsters, the jungle gym is a good project to start with. Since most of the construction consists of boring holes and fitting dowels, a drill press is a big help here. If you use a brace and bit, take care to make all of the holes perpendicular.

Use two-by-fours for the uprights, two-by-twos for the top stringers and bottom braces, and 1″ dowels for the rungs (dimensions shown in the drawing are actual dressed sizes). Cut notches in the upper ends of the uprights to receive the stringers, and round off the corners of the stock on either side of each notch. Also, bevel or round off the ends of the stringers as a safety precaution.

Rungs. Spot hole locations on the uprights and stringers and, in all cases, drill completely through the stock. Next, insert the dowels in the holes and force the assembly together, checking for final dimensions before cutting off excess doweling that projects beyond the framing. Use glue and finishing nails to anchor the dowels in place.

The two braces that broaden the base should be attached to the uprights with bolts, so that you can remove them when you carry the equipment indoors.

SLIDE

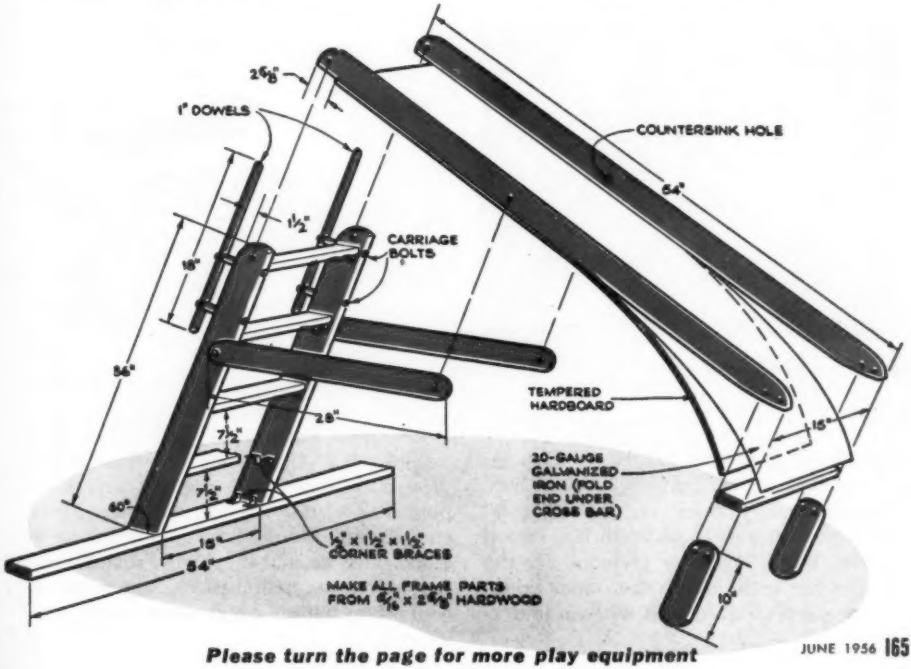
TREAD-TYPE steps make it easy for the smallest tots to climb to the top of this midget slide.

Cut all of the steps and frame members from 1″-by-3″ stock, rounding ends and corners with a jigsaw, as shown in the drawing. Note, too, that the sides of the slide have a slight curve along their bottom edges, starting a foot back from their lower ends.

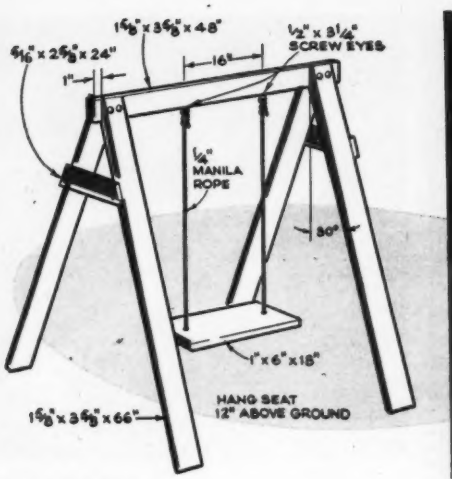
Start the assembly by fastening the four steps and the long bottom brace to the side members with 1½″-by-1½″-by-½″ corner braces. Make the handrails and the spacers that hold them away from the side members from lengths of 1″ doweling. Use a jigsaw to round one end of each spacer inward for a snug fit with the rail. Drill through the rails, spacers and side members for ¼″ carriage bolts.

Making the slide. Nail a 6′ strip of 20-gauge galvanized metal, backed by a 54″ strip of tempered hardboard, to the bottom edges of the side frames, placing the metal so that it extends 3″ beyond each end of the hardboard. Then screw a cross brace under each slide end. Fold the excess metal down and under these braces and nail to the undersides.

Attach the slide to the ladder section with ¼″ carriage bolts. Countersink the holes for these bolts so that the nuts can be recessed and covered over with wood putty. Use the same method to attach the side braces and legs.



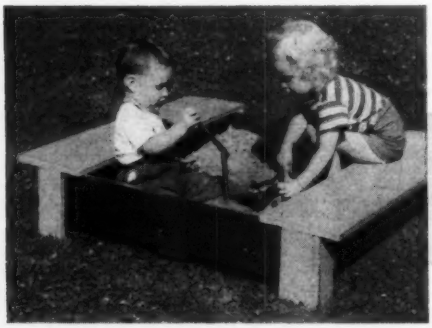
Please turn the page for more play equipment

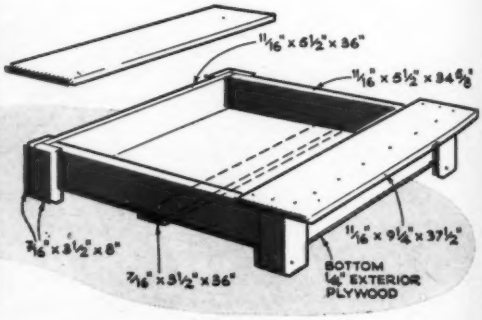


SWING

SAWHORSE construction makes a sturdy gantry for either a store-bought "safety seat" swing or, if you prefer, a plain, old-fashioned board drilled at both ends for a length of manila rope.

Saw off one end of each of the two-by-four uprights at a 30° angle and bore holes for the carriage bolts that fasten the uprights to the two-by-four crossbar. Screw supports to the outer edges of the uprights, and trim them flush with the sloping faces of these uprights. Attach a pair of screw eyes to the underside of the crossbar and hang the swing. If you use rope, check the knots frequently.





SANDBOX

SEATS on this sandbox double as convenient shelf-like play surfaces. Make the box sides out of 1"-by-6" stock and attach them with 1½" wood screws. Use ¾" exterior plywood for the floor. After nailing it to the under edges of side pieces, reinforce it with an underlying strip of 1"-by-4" stock screwed to opposite sides of the sandbox.

L-shaped legs, each made from two sections of 1"-by-4", hold the box off the ground, reinforce the corners, and support the seats. Attach the legs with countersunk wood screws, covered with wood putty so that they won't rust. Finally, set on the seat boards, again using countersunk screws and wood putty. END

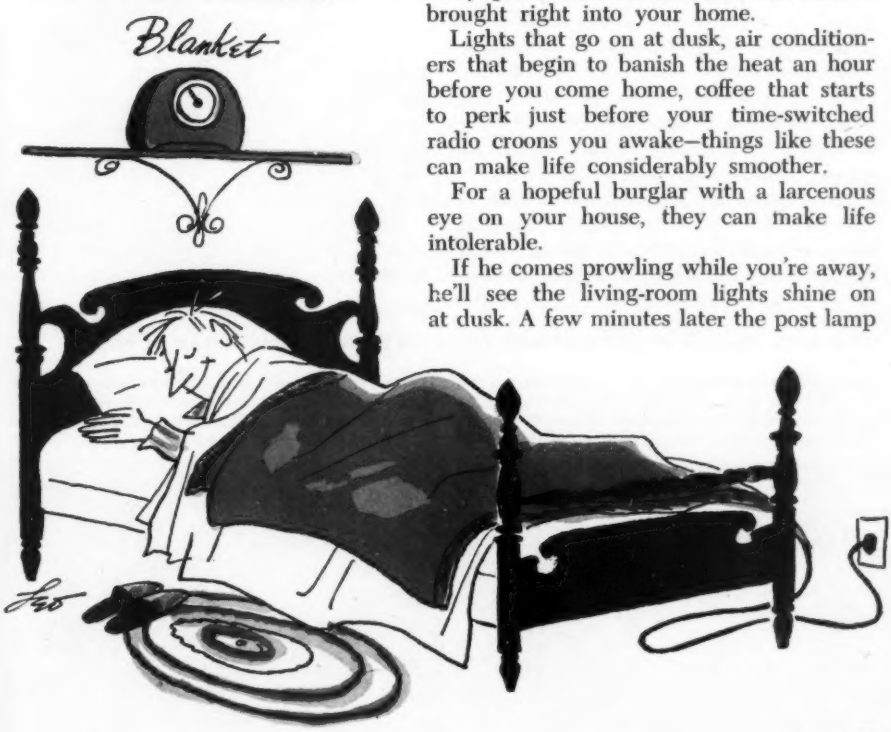
Now Automation Can Run Your House

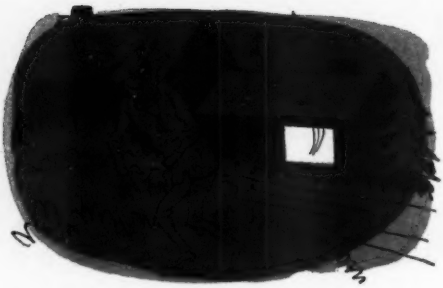
WHEN you wire up your electrical devices with time switches, you don't even have to push buttons. They push themselves. That's automation brought right into your home.

Lights that go on at dusk, air conditioners that begin to banish the heat an hour before you come home, coffee that starts to perk just before your time-switched radio croons you awake—things like these can make life considerably smoother.

For a hopeful burglar with a larcenous eye on your house, they can make life intolerable.

If he comes prowling while you're away, he'll see the living-room lights shine on at dusk. A few minutes later the post lamp





MUSIC AND FLASHING LIGHTS prowler-proof your home while you rest peacefully in the country.

lights up. Maybe for a while there's a snatch of radio music.

The prowler goes away. If he returns later, he may be just in time to see the ground floor go dark—and seconds later a light go on in an upstairs room. As he scurries for cover, he never guesses that the "occupants" are only a few inexpensive time switches.

Box with a memory. A time switch is simply an electric clock combined with an electric switch. A number of companies make them. The simpler types are sold by department and appliance stores, while the more complex switches are available from hardware and electrical-supply dealers and mail-order firms.

As a portable unit for home use, a time switch is a fist-size plastic case that has a receptacle into which you can plug any small appliance. The appliance will go on at any hour that you choose, then off again at any other hour. The timer will repeat this cycle day after day, whether you're around or not. You can buy one for about $10.

A slightly more elaborate variety has manual switches as well, for times when you want to take over yourself. A typical model has four manual positions—temporary on, temporary off, permanent on and permanent off. With the temporary positions, you can interrupt the cycle for a short period, and it will go back on automatic at the next time setting. The permanent positions give you manual control indefinitely.

Also made in attractive plastic models are timers that are electric clocks, too. One type has an additional feature—a buzzer that goes on from one minute to four hours after you set it. It's handy for timing eggs, pressure canning and photographic work. A simplified timer, made especially for defrosting a refrigerator, will turn it off just long enough for the ice to melt.

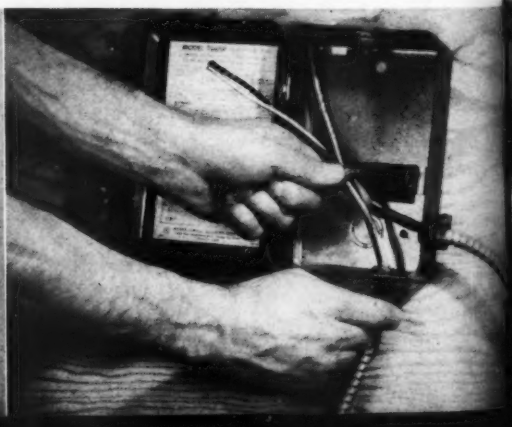
Heavy-duty jobs. The fancy-finished portable time switches are limited to average plug-in appliance loads, the highest of which is 1,650 watts. But you may have a bigger load to handle—say an electric radiator or a hot-water heater for a vacation cabin.

For these, you can get husky, high-capacity time switches that come in plain metal boxes and are designed for perma-

You can install a permanent time switch in four easy steps

TIMER CONTROL lifts out of metal housing so that you can screw box to wall and wire it up easily. In this International Register model, simple spring clips release the mechanism.

TWO CABLES, one from the power source and one to the appliance, are led into box through knock-out openings. Use same type and size of cable that is used in the other house wiring.



nent mounting in a garage, basement or other out-of-the-way place. Most of these require permanent wiring, but cost little more. You can get one for $10.95 that will handle a one-horsepower motor or any appliance up to 4,000 watts.

If you use that cabin only on weekends, you can get a special skip switch that will turn on the water heater before you get there on Saturday and turn it off after you leave Sunday, skipping the other five days. For more elaborate control, there's a calendar switch with a seven-section dial on which you can set the times for every day in the week separately. Another model lets you change your mind as many as 96 times a day. It is also made with Sunday and holiday cutouts.

Automatic living. Here's how a typical day might go—if you had a brother-in-law who owned a time-switch factory. (Even without that brother-in-law, a few switches in the right places can help you do many jobs that you can't do yourself, or might not remember to do.)

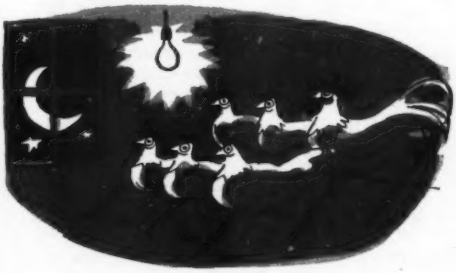
A BRIGHT WELCOME is insured by garage and post lights that go on before you get home.

To wake you in the morning, a time switch converts your ordinary radio to a sweet-whispering alarm clock. Another one makes sure that you won't forget to turn off the electric blanket.

Meanwhile, a switch in the kitchen has started a coffee maker, and another one has turned on an electric heater in the bathroom to prewarm it for shaving. If your furnace has a manual thermostat, a switch can make it automatic. Or if you already have a clock type, an extra timer hooked into the circuit will cut out its automatic operation for periods up to a week when you're going to be away.

Your car starts instantly because your electric engine warmer—perhaps just a couple of heat lamps directed at the oil pan—has gone on an hour before.

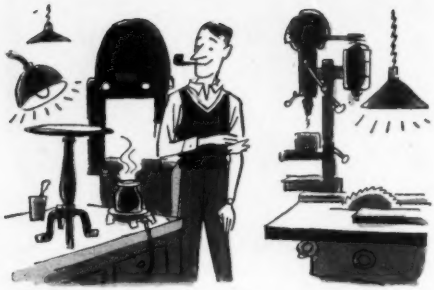
You arrive at work to find the place already warmed by a timer-controlled heater—or aired by a fan or cooled by an air conditioner. Night lights have shut



HENS GO ON THE NIGHT SHIFT as timer-controlled "daylight" coaxes extra egg production.

ONLY THREE CONNECTIONS are made after timer mechanism is slipped back into housing. Black leads are fastened to terminals marked "line" and "load," and white ones go to a common post.

TO SET SWITCH, you start the clock and turn the dial to present time of day. Two pointers around edge of the dial are then set at the hours that you want the switch to go on and off.



SHOPWORK SPEEDS UP with a prewarmed glue pot, heat lamps that go out after you're in bed.

themselves off, while any showcase or window-display lights have gone on.

Around-the-clock comfort. At home, time switches are still at work. Your wife, off on an afternoon call, plugs the electric roaster into a timer so that dinner will be hot and ready when you both arrive home.

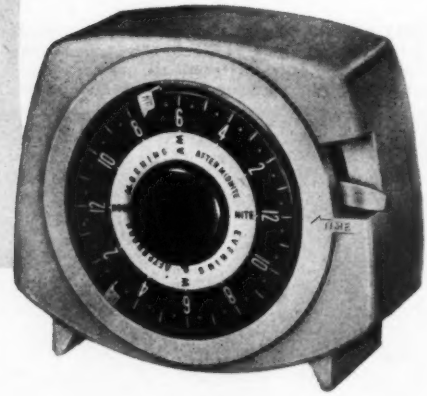
Portable heaters prewarm the playroom in time for the kids when they get home from school, then switch on and off every 15 minutes or so to produce the desired temperature without requiring a thermostat. No danger that anyone will bake under a heat or sun lamp, either—it shuts off by itself.

Evening chores. When you arrive home at night, your garage light is already on—and will shut itself off later without your remembering to. Later, your TV set pops on because you've set it so that the kids won't miss their favorite program. You've also set it to go off at bedtime—kids can't argue with a time switch.

When they're all tucked in and watered down, you "cheat." You flip over the manual switch and watch your own TV programs. When you leave your workshop, another time switch takes over to give the glue joint or paint job just the right number of hours under heat lamps for a quicker drying.

At bedtime, off goes the porch light and on goes the electric blanket. On warm nights you switch the fan to go off after you've fallen asleep.

If you're a farmer, timers control your water pumps, electric fences, ventilating fans and other devices that operate at set intervals throughout the day and night. Your hens are working overtime under lights that are turned on and off by a special timer which even provides a dimmer period of 20 minutes so the chickens can roost safely.—*Darrell Huff.*



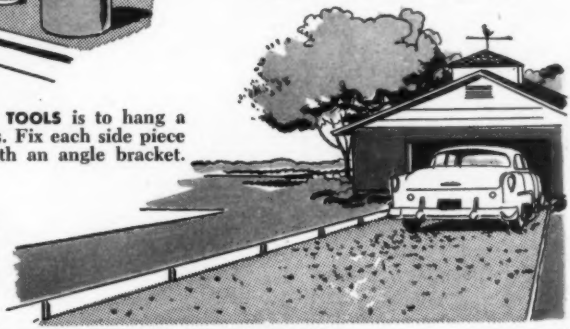
PLAIN OR FANCY. Plug-and-socket timer above handles large appliances without requiring permanent wiring. Plastic-cased unit at right is for portable use with small appliances only. Make sure that wattage capacity on timer equals or exceeds that marked on the appliance.

Keeping the Home Shipshape

LIGHT UP AN UMBRELLA to enjoy your patio after dark. An outdoor-type spotlight bulb in a clamp-on holder can be fixed to the stem. Use weatherproof sockets and wiring.

A SLICK WAY TO RACK KITCHEN TOOLS is to hang a slotted shelf beneath wall cabinets. Fix each side piece to the underside of a cabinet with an angle bracket.

A HOMEOWNER'S GUIDE is what you get if you file the instruction books for all your appliances in a loose-leaf cover. Add a page to list sizes of small items such as faucet washers and window shades.



CRUSHED STONE from a driveway won't flip over onto the lawn if you build a low wall between the two. It can be made of strips of ¼" tempered hardboard staked in the ground every 6′ or so.

Please turn the page for more home tips

More Home Tips

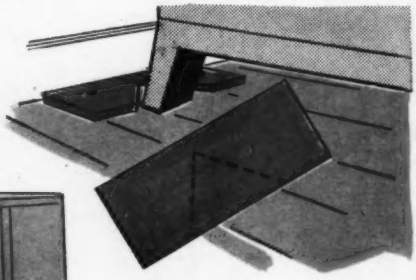
MARK THE DIAL of your clock radio at your favorite wake-up station with a bit of tape or a dab of nail polish. It's easy to turn to at night after you have heard a program at another spot.

STORING WINTER WOOLENS? Old nylon stockings make good moth vaporizers. Fill the feet with moth balls or nuggets and knot the stockings' upper ends over the closet rod.

WHEN YOU TILE A BATHROOM order extra tiles. Then you can cover a plywood frame to make a hamper that matches the walls. Leave the back free of tiles and drill some holes in it to allow for ventilation.

EMPTY PEANUT-BUTTER JARS used for refrigerator dishes will look like purchased sets if the screw tops are enameled to match your kitchen walls or cabinets. Also foods in the jars will be easy to identify.

CHECK THE WINDOW—sash, frame, sill and cord—before installing your air conditioner. Glazing, puttying, calking, painting and other necessary window repairs are much more difficult to make after the conditioner is in place, and may even require costly removal and reinstallation.



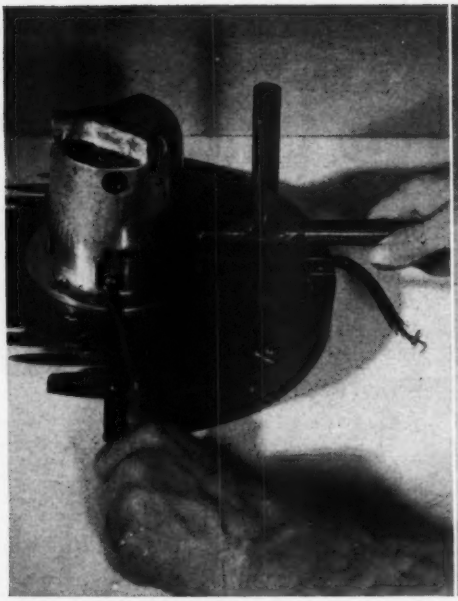
FURNITURE STOPS will keep sofas and heavy chairs away from walls and picture windows. Cut notches or leg slots in 2"-by-4" rectangles of thin wood and brad them to the floor. Finish to match the floor.

An old vacuum-cleaner motor and a few hours' work let you

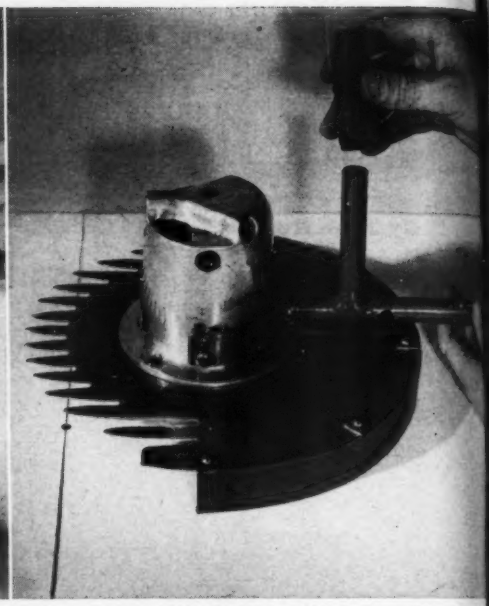
Trim Hedges the Quick Way

By John Rogers

AN OLD vacuum-cleaner motor and a keyhole-saw blade gave me the working parts for a rotary trimmer that does a neat, fast job of clipping hedges and shaping shrubs. The trimmer has a combination rake and guard that protects the operator from both the whirling blade and the flying cuttings. It also traps the heavier cuttings, giving the blade a chance to mulch them before



HANDLE MOUNTS on this motor from an old Apex vacuum cleaner were made to order for a firm connection with the trimmer's handle—a length of ¾" conduit. The motor's lead cord is threaded through a hole drilled in the yoke.



SMALL HANDLE-BAR GRIPS are fitted over the conduit. A heavy-duty electric cord is threaded through the horizontal pipe from the rear, then drawn out through a hole in the sidewall and the wires spliced onto the motor leads.

they are tossed clear of the housing.

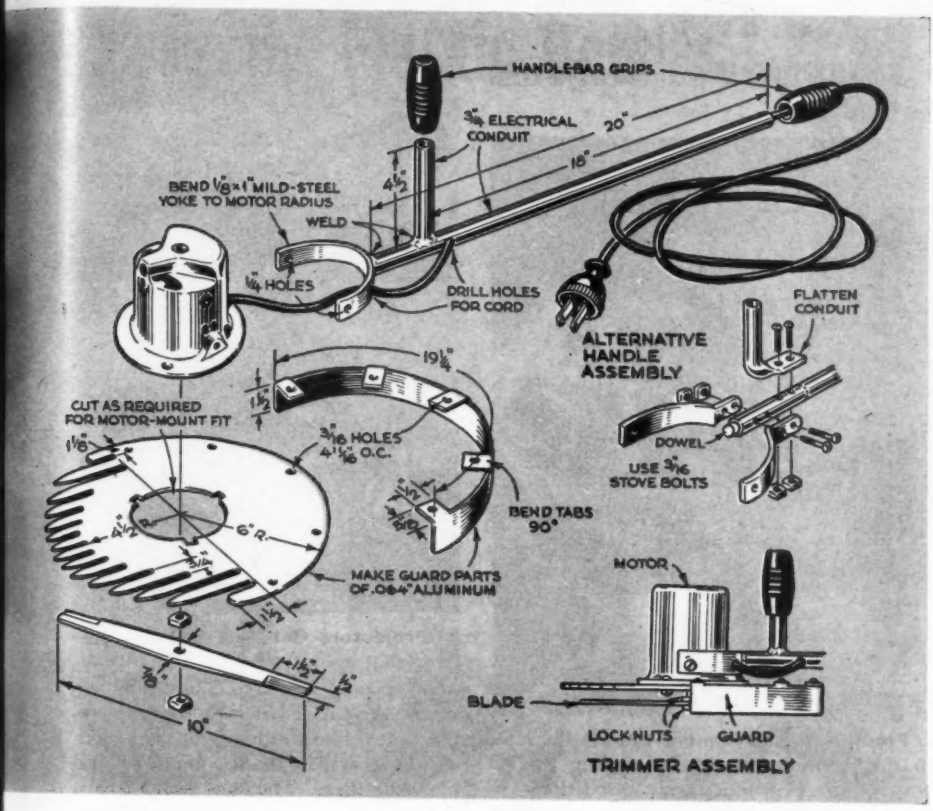
You can build a similar trimmer in a couple of evenings, once you've latched onto a discarded motor of the type used on old upright vacuum cleaners. Most electrical-appliance houses have a few traded-in models of this kind stowed away in the back of the store, so you shouldn't find it hard to get one.

Attaching the handle. The design of your motor may call for slight modifications in the hedge-trimmer plans shown here. Down near the mounting flange and on opposite sides of my motor I found two flat-faced projections drilled and tapped for the vacuum cleaner's handle connection. These gave me convenient mounting points for the handle of my hedge trimmer.

If your motor housing doesn't have such mounts you can substitute a ring-clamp for the trimmer-handle yoke, as shown in one of the drawings. Don't attempt to drill and tap the motor housing for a bolted connection; there's a close-fitting fan inside the lower section of the housing and the blades are likely to strike any bolt projections.

I welded the three parts of my trimmer handle together. Don't let that throw you. If you don't have a home welder and want to save the expense of having a shop do the job for you, you can assemble the handle parts with stove bolts. If you use bolts, be sure to insert a dowel plug in the forward end of the long handle to reinforce the thin-walled tubing.

Forming the disk rake. Like the trimmer handle, the rake-and-disk section of the guard will have to be tailored to the motor. Most motor housings have a shallow collar at the lower end which fits down into the vacuum-cleaner casting. If yours is this type, cut the hole at the center of the guard just large enough to receive the collar. Otherwise the guard won't fit flush against the motor housing's base flange, and the comparatively thin



metal will buckle when you tighten up the bolts that fasten the guard in place.

To form the rake, drill ¼" stop holes at ¾" centers before making the parallel cuts for the tines. The only exceptions are the two outer stop holes. As shown in the assembly drawing, they are centered 1⅛" in from each guard side.

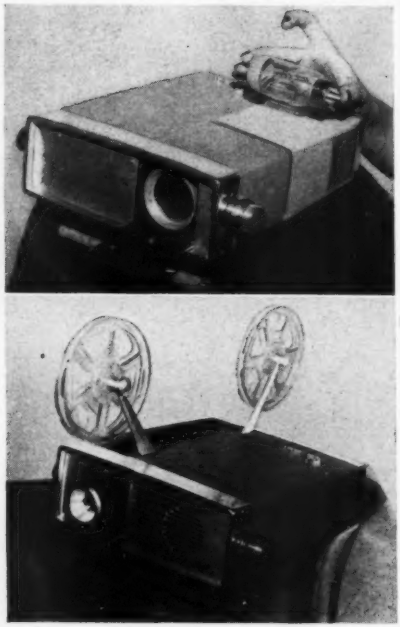
Shape the edge section of the guard and drill holes in its tabs before drilling mating bolt holes in the disk section. By positioning the edge strip on the periphery of the disk you can spot the second set of holes accurately.

The blade. A dime-store keyhole saw supplies the cutter blade. File or grind it to shape, then bore a hole the diameter of the motor shaft through the center of the blade with a high-speed bit. Bolt the guard to the motor and attach blade to the threaded shaft end with two lock nuts.

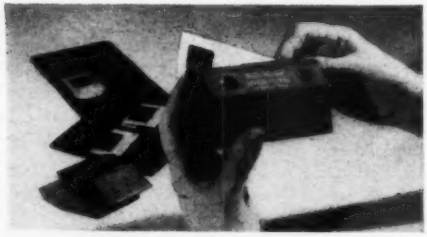
TWO LOCK NUTS, threaded onto the motor shaft, provide a safe mount for the keyhole-saw blade. Some vacuum-cleaner shafts turn counterclockwise—check yours before you file or grind the cutting edges on the blade. END

New for Camera Fans

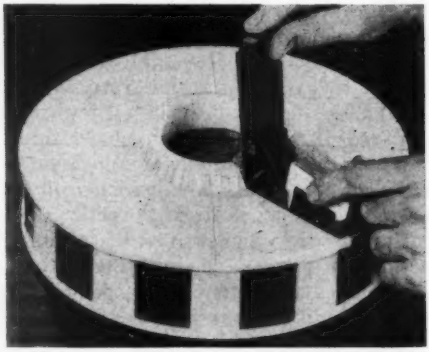
1. Finding F-Stop Easier. You set the lens on this 16-mm. camera by dialing to the description of outdoor light conditions. A three-position button permits normal or continuous runs and single-frame shots.



2. Projectors Get New Look. A new lamp that operates horizontally or vertically is causing sharp changes in projector design. Flat slide and movie machines, like the experimental models above, will be made soon by several manufacturers. The new lamp is just 4″ long, 2″ shorter than conventional types. The socket snaps it into focus.



3. Vest-Pocket Viewers. Made of folding paperboard with ground-glass lenses, the little 3-D and slide viewers above focus by pressing the top and bottom. Each is in a case that will hold several slides. You can get binoculars like them.



4. Revolving Slide Case. You can locate 35-mm. slides quickly in this circular plastic file case having 12 labeled compartments for 300 slides. Its rotating top has a lifting bar in its opening.

More information *about these products can be obtained from: 1. Bell & Howell Co., 7100 McCormick Road, Chicago 45; 2. Sylvania Electric Products, Inc., 1740 Broadway, NYC 19; 3. Taylor-Merchant Corp., P.O. Box 52, Cathedral Station, NYC 25; 4. J. & M. Zadiix Products Co., 299 Third Ave., Brooklyn 15.*

9 USES FOR Plastic Bottles

WINDSHIELD WASHER

PAINT SPRAYER

OIL SPRAYER

QUICK STARTS IN COLD WEATHER

GLUE DISPENSER

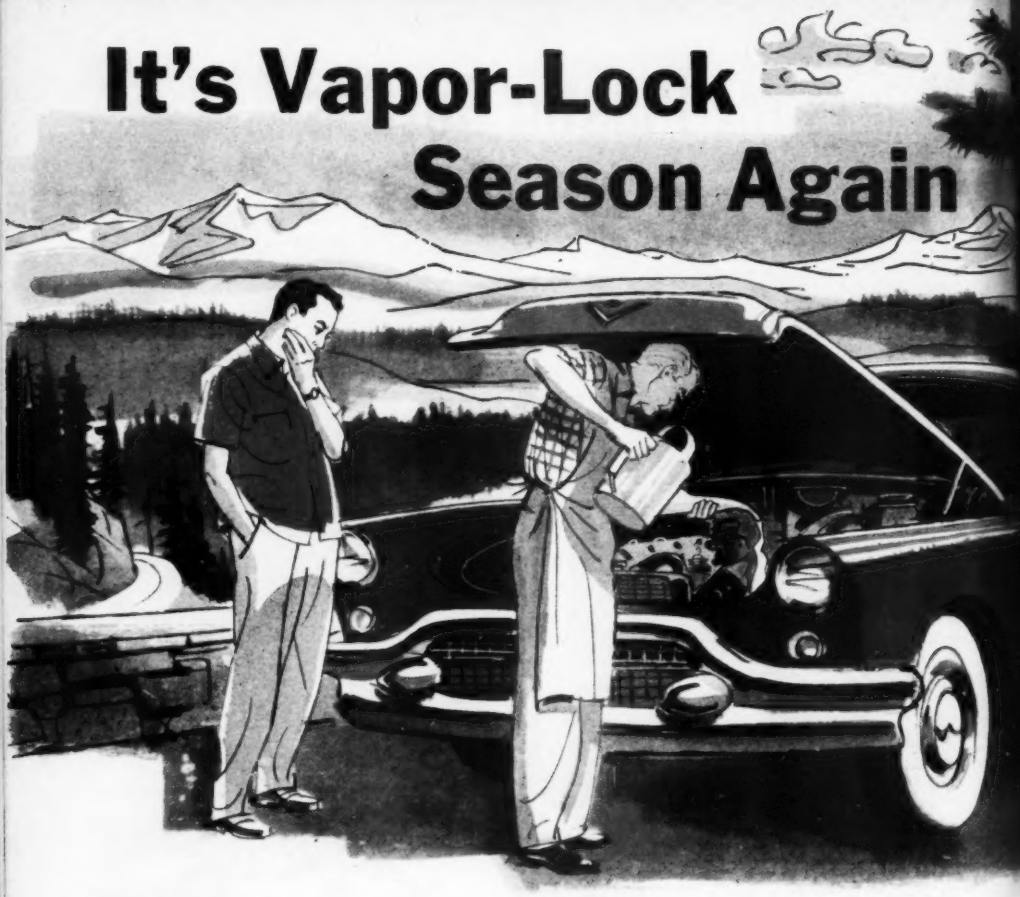
POLISH APPLICATOR

FOR DUSTING MODELS *(USE EMPTY BOTTLE)*

LIQUID SOAP DISPENSER

BREAKPROOF TRAVEL BOTTLES

It's Vapor-Lock Season Again



By E. F. Lindsley

THE DRIVER of an expensive hardtop stopped halfway up a steep mountain road to admire the view. The turnout was 8,000 feet up, a sign on the lookout stand proclaimed. Ten minutes later the tourist confidently pushed the starter button. The engine coughed a few times, the starter whined —and that was all.

This was a real case of vapor lock. The driver had filled his tank before the climb with fuel for sea-level operation and moderate temperatures. A hard, fast drive across the desert had heated the engine and the fuel in the tank. The hard pull up the mountain had added to the engine's heat. Stopping this superheated engine in the reduced air pressure at the high altitude had caused the hot fuel to boil, vaporizing into bubbles in the fuel line.

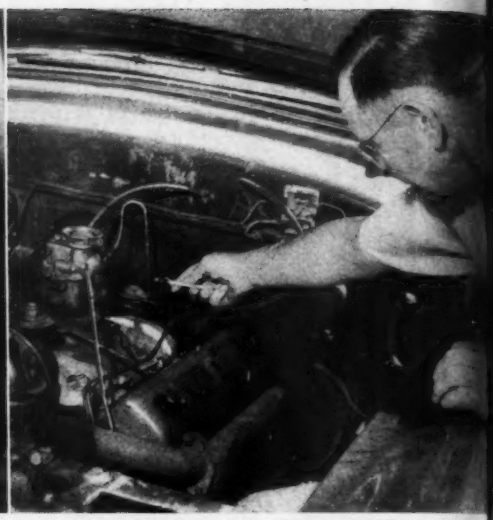
Although the car was in perfect mechanical condition, it would not start because of a fat bubble of vapor in the fuel pump and some smaller bubbles in the carburetor discharge tube.

Cools off hot fuel system. The operator of the roadside lookout had seen this happen before. He lifted the hood to let the cool mountain air at the engine, poured cold water over the fuel pump, fuel lines and the outside of the carburetor, and removed the cap from the gas-tank filler tube. The car soon started. If it had not, he could have played his ace—a tire pump with a sponge rubber ball forced over the end of the hose. With this he could have put a little air

The lookout-stand operator lifted the hood and poured some cold water over the fuel pump.

QUICK FIRST CHECK for any fuel trouble is to jiggle the throttle linkage while looking down the carb's throat (left below). If fuel squirts into the throat, carb is getting fuel. If carb is dry, disconnect fuel line at float chamber to check pump. Hold line over a jar (right) and kick engine over with starter. A healthy pump will shoot a strong spurt of gasoline into the jar; a weak spurt or none at all will put the blame on the pump, line, or gas tank.

AIR LEAK in vacuum hose will cause a rough idle and lean fuel mixture. This hose has become heat-baked and cracked after 28,000 miles. The flexible coupling to the fuel pump should be checked for cracks and for "live" feel.



THROTTLE LINKAGE sometimes loosens and backs off so that flooring the pedal gives only half throttle. Adjust the linkage until the accelerator pedal controls a full throttle range and you will get the old pep back immediately.

pressure in the gas tank to force fuel through the fuel line and into the pump.

A pure case of vapor lock like this is rare in a car that is kept in good shape. Ten to one, if you have vapor lock under normal driving conditions, something is fouled up in the fuel system. A Saturday morning checkup in the shade of your garage may save a harassed Sunday afternoon on some hot highway.

Start at the gas tank and work your way up to the carburetor. Chances are that a new car that has been kept well filled with gas won't have anything wrong at the tank, but any car, new or old, that has been standing half empty can distill a lot of moisture on its tank walls. This will condense in the bottom of the tank. Pull the drain plug and drain out the gas. Pour in a quart of alcohol and jump on the bumper to slosh it around. Then drain it out. Check the vent hole in the gas cap, too; if clogged it will prevent the pump from sucking gas.

Follow the fuel line under the chassis and check every inch for dents, worn spots where retaining clips might be rubbing, sharp bends or kinks and any signs of wetness that would indicate leakage.

Check fittings and couplings and snug them up. Look over the short flexible line that joins the fuel line to the fuel pump. This flexible coupling absorbs engine movement and vibration; check it for cracks and make sure that it has a lively feel. Replace a line that feels stiff and hard. See that no part of the fuel line lies close to the exhaust manifold. Most cars are designed to keep the two apart, but sometimes bending or replacing a line brings it near a hot spot that causes fuel to boil.

The fuel pump is really the heart of the fuel system, beating continuously to move the gas from the tank to the carburetor. A pump is easy to remove. So for easier inspection and cleaning, take it off. Check the number to see that it is the correct pump for the year, make and model of your car. Most pumps look pretty much alike and someone may have replaced the original with a similar, not quite identical model that works, but not as well. Carefully remove the bowl around the filter element and wash both in gas. If the bowl gasket is ragged or

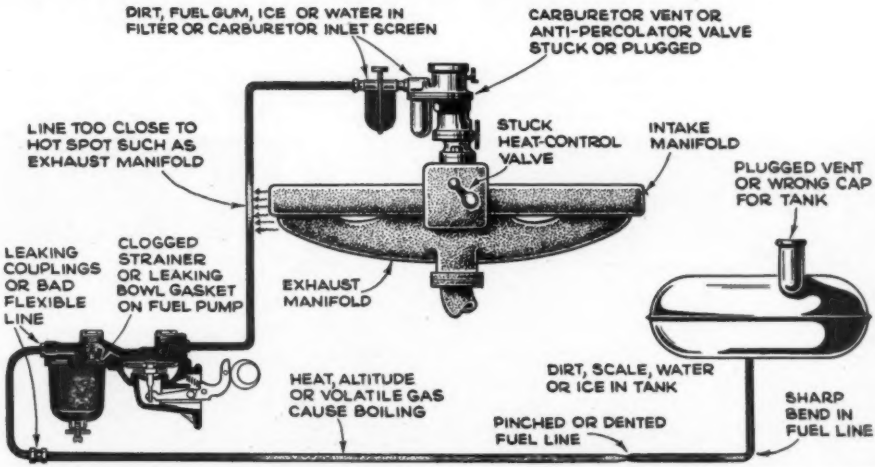
MANIFOLD HEAT CONTROL VALVE can cause vapor-lock symptoms. Stuck closed, it keeps carb too hot, causes fuel to boil; stuck open, it gives poor warmup, leads to carburetor icing. Wobble the counterweight to be sure that it's free.

SELDOM-NOTICED TAILPIPE may become choked with dirt that you may have backed your car into, causing exhaust back pressure and hot engine operation. Look at it once in a while to see that it has not become bent or obstructed.

hard, replace it—you can get one at a local auto-supply store. A poor seal here will permit the pump to inhale air and mix it with the fuel going to the carburetor; even a tiny amount of air will affect performance. For the same reason, try to snug down the diaphragm-retaining screws that encircle the pump flange.

Car builders say that the fuel pump diaphragm moves only about 1/64" in normal operation. This little flutter occurs intermittently as the fuel level in the carburetor drops and opens the float needle valve. See that there are no pieces

Check your car against this chart to find fuel-system trouble



of gasket stuck to the block or pump; this would shim the pump out, keeping the arm from getting a full stroke. When installing a new pump, use a new gasket the same thickness as the old one.

Check carburetor. Move along to the end of the fuel line to the carburetor. When a hot engine is stopped, the heat beneath the carburetor can cause the fuel in it to "percolate." Late-model carbs vent vapors through large passages, and eliminate percolating. Older cars were sometimes equipped with an anti-percolator valve to unload vapors; you'll recognize this as a useless-looking little spring-loaded valve on the float bowl cover. A cam from the throttle linkage opens the valve when the engine idles or stops. As the throttle is opened, the valve closes and venting occurs through other passages.

Wash these parts with lacquer thinner and a small brush if they are covered with fuel gum. A complete disassembly and cleaning of all carburetor parts with lacquer thinner is always a good idea, but unless you're relaxed when taking apart alarm clocks, TV sets and Yale locks, take this job to a carburetor expert.

Finally, for trouble-free driving, dunk the carburetor's air cleaner in gas, shake or blow it dry and re-oil it. END

Window Plant Box Lined with Rustproof Lead Flashing

LEAD LINER IS SLIT with a handsaw 1" from the bottom for an aeration vent. Bend inward over the cut to keep the soil from spilling out.

SHEET lead is an easy-to-work material for lining planting boxes. It won't rust. You can get it at plumbing-supply houses as 3-lb. stock, which plumbers use for vent-pipe flashing.

Lay out the inside dimensions of your box on the lead sheet. Then cut out the corners with tin snips, leaving an overlap for soldering the joints. Solder after the finished liner has been inserted in the planting box.

After bending to shape, cut a vent slit to allow air to get to the soil. Drill a pilot hole first and lengthen with a penknife to admit the end of the saw. A matching vent will, of course, have to be sawed in the outer wood box.

LEAD IS EASILY CUT to make the notches for the corners. Leave a 1" overlap on the front and the back for the soldering surfaces.

BENDING IS SIMPLER if a wood block is used as a guide. The 3/64"-thick sheet lead can be worked into shapes other than rectangles.

Transistor Portable Plays 45's Anywhere

By Howard G. McEntee

YOUR 45-r.p.m. records can go along with you to make music wherever you are, even beyond power lines and the reach of radio stations. Here is a homemade record player designed to work anywhere, anytime. It needs only one battery, for it has a transistor amplifier and a wind-up motor.

The class-B transistor amplifier delivers a quarter of a watt output—enough for good room volume—yet it takes little current, drawing a maximum only on the loudest passages.

Selecting the motor. The small single-spring motor shown, altered to turn at a reliable 45 r.p.m., plays both sides of a standard 45 disk before it needs another boost. Motors like this can be bought for about $6. A dual-spring motor would run longer, but would make the unit heavier, less convenient to carry around.

You may be able to take your motor

HALF OF A "B" BATTERY is held on the amplifier base by a length of perforated pipe strap. As the flat battery cells are held in contact by pressure alone, the strap is run from end to end rather than crosswise. Thin sponge rubber cushions the strap and battery stack all around.

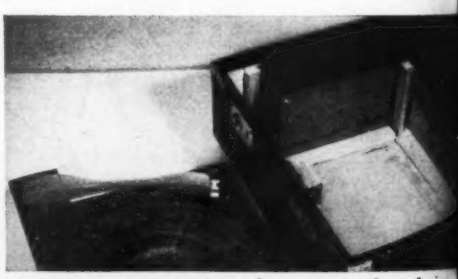
out of a discarded wind-up phonograph, and if it's portable use the case, too.

Mounting the works. If you do use an old portable, you can probably leave the motor where it is and fit the speaker, battery and amplifier around it. Should you buy or build a case, the turntable diameter will determine its dimensions. The ready-made luggage case shown here is 6½" deep, 9½" wide and 13½" long.

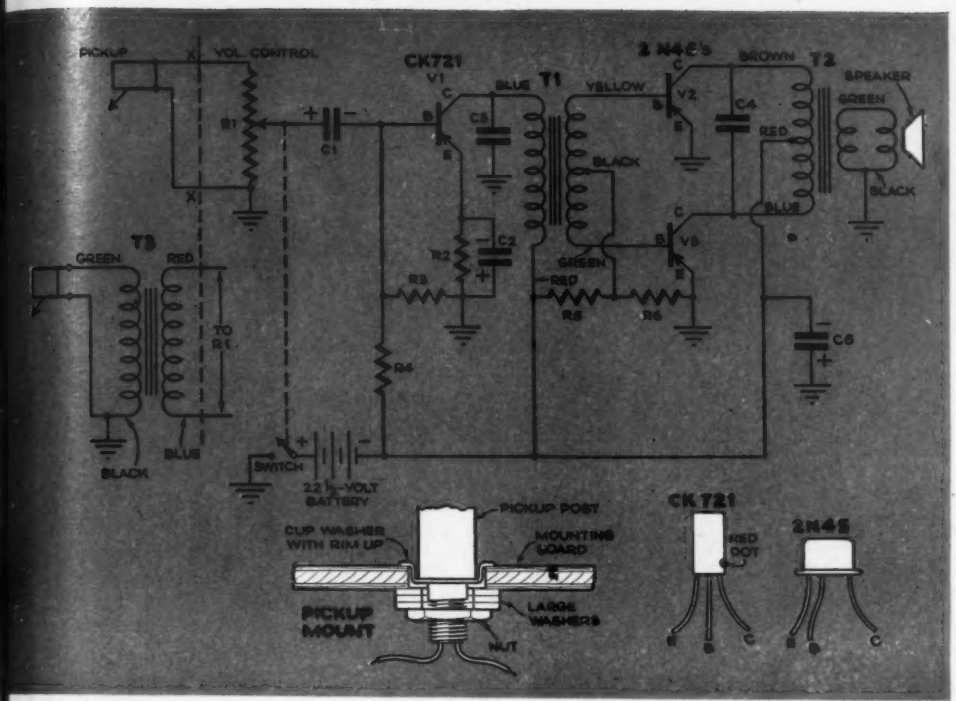
Cut a mounting board from ¼" plywood to fit inside the case. Then use the

PARTS LIST

V1: CK721 transistor
V2, V3: 2N45 transistor
T1: Class B input transformer (Fed. Purch. 402W 5)
T2: Class B output transformer (Fed. Purch. 402W 6)
Pickup: (Fed. Purch. 402X7)
Speaker: 4" × 6" oval speaker (Quam 46A15 or equiv.)
Battery: 22½ volt, see text
C1, C2: 25 mf., 25 volt electrolytic
C3: .005 mf. disk ceramic
C4: .05 mf. paper
C5: 100 mf., 25 volt electrolytic
R1, SW: 10,000 ohm variable, with SPST switch (IRC Q13-116)
R2: 4,700 ohm, ½ watt carbon
R3: 10,000 ohm, ½ watt carbon
R4: 47,000 ohm, ½ watt carbon
R5: 12,000 ohm, ½ watt carbon, 5% tolerance
R6: 68 ohm, ½ watt carbon, 5% tolerance
T3: any small 3-1 A.F. transformer (optional)
78 r.p.m. windup phono motor (Gen. Industries, "Master Junior")
Misc.: Case, plywood, 2 6-lug strips, speaker grille, knob, fuse clips, etc.



MEASURE HIGHEST PART on the mounting board (probably the pickup post) and the depth of the case lid. Cement small wooden posts into the case at a height that allows parts about ¼" of clearance with the lid shut. Fasten the board in with wood screws driven into the posts.

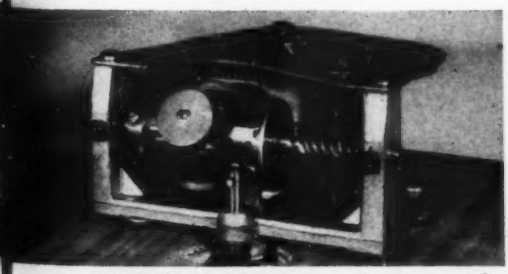


AMPLIFIER is simple to assemble, but should be built with parts specified because transformers were selected to give best results with these transistors. Dashed line at left of diagram indicates connections for optional transformer, which may be desired for greater output.

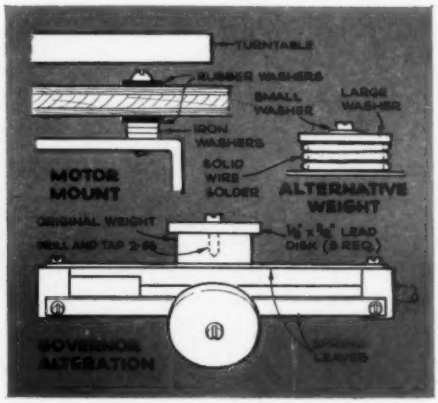
turntable and pickup arm to plan the layout. Locate the motor so that the crank will emerge at the front or right side. Spot the pickup pivot, using the maker's instructions, so that it tracks correctly.

Use rubber washers on the motor mounting bolts on both sides of the board. Space the motor an extra ¼" below the mounting board with washers.

How to maintain 45 r.p.m. A spring motor may not hold to slow speed over the full range of spring tension. So add a



GOVERNOR IS GIMMICKED to improve regulation at low speed by adding lead disks to the weights. If lead is not available, use iron washers or wrapping of wire solder as in the drawing (right). Make certain that weights will not strike frame when springs bow out in motion.



NO SOCKETS ARE NEEDED for the transistors. Cut leads 1" long and solder them to the lug strips. To protect the elements from heat, hold each lead with long-nose pliers just back of the lug. Hold the pliers shut with a rubber band.

DEEP WELL at one end of this case holds 45-r.p.m. records vertically. Battery and amplifier are on a 6"-by-8" panel screwed to the case bottom.

bit of extra weight to each of the governor weights. Take out the screws at the ends of the flat spring leaves to remove the weights. Drill and tap these at their centers for small machine screws.

Small lead disks are excellent for the auxiliary weights. Ordinary washers will do or, if space is lacking, use a thin washer with a few turns of solid wire solder, as in the drawing. If possible, weigh each weight to get them alike.

To adjust the motor to 45 r.p.m., put a slip of paper under a record and count revolutions against a watch, or use one of the stroboscope disks sold for checking turnable speeds. When speed is determined, lock the adjustment.

What size battery? If your case is small or you want to keep weight down, use a 22½-volt C battery such as the Eveready 763 or equivalent. This will give upwards of 50 hours' use.

A more economical deal is the 45-volt Eveready 487, which has two stacks of 22½ volts each. Cut them apart and use one at a time; each is good for more than 125 hours. Or you could solder 15 flashlight cells together.

Amplifier. It is important to stick to the parts specified. The 2N45 transistors will carry the high currents involved, and the transformers named are specially made to match them. Others may give inferior results.

Mount the transformers with straps cut from 1/32" aluminum.. All the other parts, including the three transistors, are soldered to two lug strips.

The transistors are the PNP types, with which the positive side of the battery goes to ground. Be careful to connect the electrolytic condensers accordingly (plus to ground, the reverse of tube-circuit practice).

The high-impedance pickup is hooked directly to the relatively low-impedance volume control and input circuit. This eliminates one transformer at the cost of gain. If you need more gain or use a low-output pickup, connect a 3:1-ratio audio coupling transformer (T3) ahead of the volume control at the points marked x—x in the wiring diagram.

Final touches. Mark out the opening for the speaker in one wall of the case. Slit the fabric 1" inside this with a razor blade, and fold it back so that you can cut through the wall with a keyhole saw. Then tape or cement the fabric covering back around the hole.

For a record compartment, saw a notch out of the mounting board and build a box in the case below it. The walls can be of hardwood, cemented together.

Mount two cartridge-fuse clips inside the lid to hold the winding crank, and a smaller clip on the mounting board for the pickup head. END

Another Article About
The Other Fellow's Shop

Contract Jobs Are His Business

Otto Bruns applies hobby skills to big-plant headaches —and turns them into substantial small-shop profits.

By Phil McCafferty

TWELVE years ago Otto Bruns backed his automobile out of the garage to make room for a modest home workshop. Today, that same little shop is a bustling small-parts factory that turns out everything from pearl-button cutters

to hydraulic valves for heavy earth-moving machinery.

Bruns was a machine-shop foreman in a Marion, Iowa, war plant when he first set up his hobby shop in the garage. After his 12-hour factory shifts he still found relaxation in designing and machining precise firearms parts. He also found a customer for every rifle he could produce. But this hobby business was soon crowded out by less romantic work.

The war plant that employed him was making an experimental relief valve for a hydraulic control system. The heat-treated steel was so tough that machinists were lucky to complete three valves per shift. When the valve proved its worth nobody knew how to put it in high-speed production.

Bruns asked if he could experiment with a dozen of the valves in his own shop. Working with his only power tool —a 10-inch bench lathe—he finally hit on a solution to the production headache. He found that a tool made of high-speed cobalt-alloy steel not only bit into the tough stuff, but brought the valve face to a finish and tolerance better than the specifications called for, without resorting to grinding. When he took the machined parts back to the plant he was offered a sub-contract to turn out the entire batch of valves in his own shop.

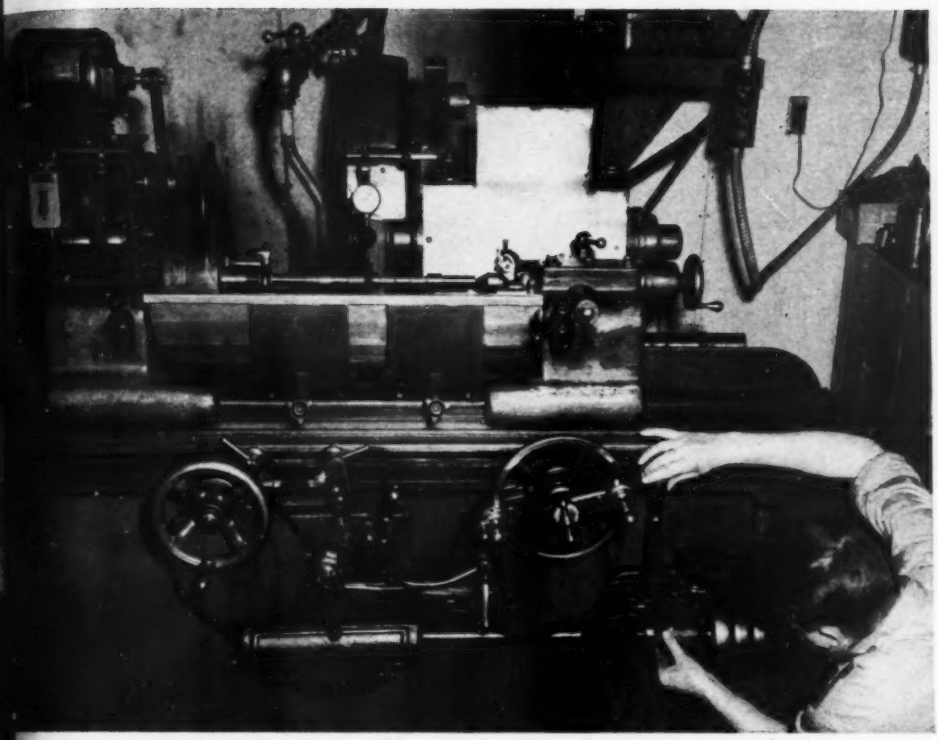
This is one of a series of articles about noteworthy home workshops. See POPULAR SCIENCE MONTHLY *next month for a story on another fellow's shop.*

On the strength of that contract, Bruns parlayed a local bank into financing a new 16-inch engine lathe. With that and an ancient cutoff saw he picked up for 10 dollars, he buckled down to his first production run. Soon he was putting out 50 finished parts a day.

As Bruns' work became known in the area, new jobs came in. He found that little shops play an important part in today's industrial picture. Because large-plant overhead is so high, manufacturers often find it economical to farm out

LATHES ARE GROUPED close together to save steps. Often Bruns does turning operations on one lathe while another lathe, running on automatic feed, is making long initial cuts.

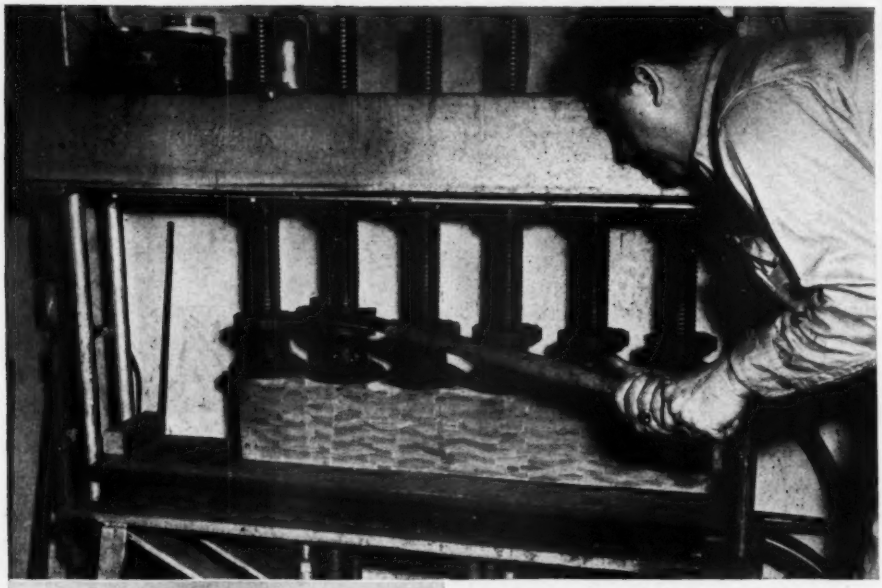
LARGEST "FARM-OUT" JOB that Bruns can handle on his lathes is this hitch pin for a self-propelled scraper. Knowing his shop's limitations helps Bruns to stay in business.

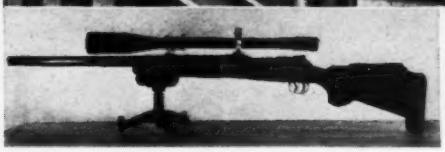


PRIDE OF BRUNS' SHOP is his recently acquired external grinder. For years it finished off crankshafts for an engine rebuilder. Bruns picked it up for practically salvage price and restored it. The sub-contractor steers clear of automatic, mass-production machines that would take him out of his specialty business—which is handling short runs of complicated parts.

REGULAR MAINTENANCE prevents costly delays. Before Bruns starts each day's production, he checks and lubricates all machinery. Here, he gives his metal-cutting saw the once-over.

AS HANDY WITH A MICROMETER as she is with a measuring spoon, Mrs. Bruns can handle any machine in the plant. She also shops for tool stock and supplies, and keeps the books.





SPECIAL GLUE PRESS (above), was designed by Bruns to laminate wood for warp-proof rifle stocks. He cuts four stock blanks from a single built-up block. Another Bruns specialty is a cast-aluminum rifle stand for bench-rest shooters (left). He also made the handsome target rifle that is displayed on the stand.

specialized and time-consuming jobs. Also, if the run is small, it doesn't pay a big shop to hire temporary help.

From the start, Bruns was convinced that the success of his setup depended upon its staying small. As more and more orders came in, he resisted the urge to buy expensive automatic equipment for which he would normally have very little use.

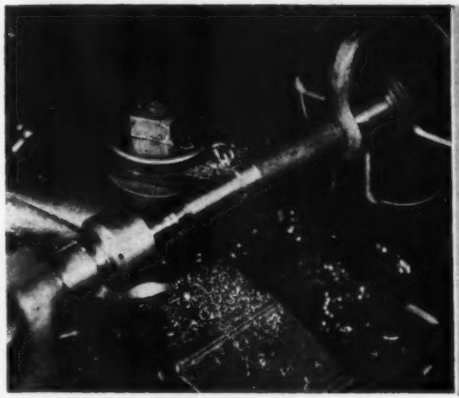
His roster of power tools, even today, is modest in relation to the volume of work that he turns out. He has three engine lathes, a vertical and a horizontal milling machine, metal-cutting bandsaw, drill press, circular saw, bandsaw, welder, two presses, paint-spray equipment and grinders.

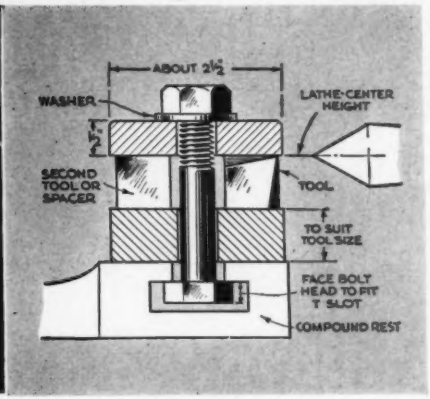
Also in keeping with the small-plant theory, Bruns' business is pretty much a one-man operation. Or, more correctly, it's a mister-and-missus business. For Bruns' wife is a top-notch machinist, too. When she isn't running the house and looking after the two Bruns children, she's almost sure to be found either working in the shop or keeping up with the bookkeeping chore.

Much of Bruns' success can be set down to smart estimating and bidding. He knows exactly how much money he must make each work-hour. But figuring how long a job will take is something else. Bruns carefully examines blueprints and specs. Then he asks himself, what special tools? What material? Who supplies it? What are the tolerances and finishing requirements? How many cuts and operations?

More than mathematics, past experience enables Bruns to come up with the right answers. Take the time he won, hands-down, on the low bid he made to machine several hundred large bronze castings. The price he got for the job didn't even cover expenses. But he knew the salvage value of the chips—and that was his profit on the job. END

New Shop Ideas





Holder Centers Lathe Tools. This tool holder positions two tools, always keeps the cutting edges at lathe-center height, and can be set with your eyes shut. It is made of a ½" bolt and two pieces of 2½" bar or shafting.

Face a disk ½" thick and drill it for the bolt. Face another to a thickness that will raise whatever size tools you use to center height. Face the bolt head to fit the compound-rest slot.

Mount a tool in each side of the holder, or use a spacer to secure even clamping with only one tool. Shim up smaller tools to bring them to correct working height. —*Phil McCafferty, Stanwood, Iowa.*

Cutting Blind Slots. To cut narrow, closed slots in sheet metal, clamp the piece to a round or a half-round piece of wood. Then saw down to the ends of the slot layout. For a wide opening, drill a hole at each end and saw to it.—*Federico Strasser, Santiago, Chile.*

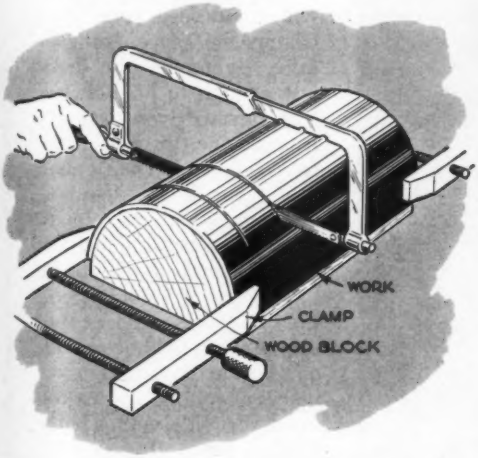
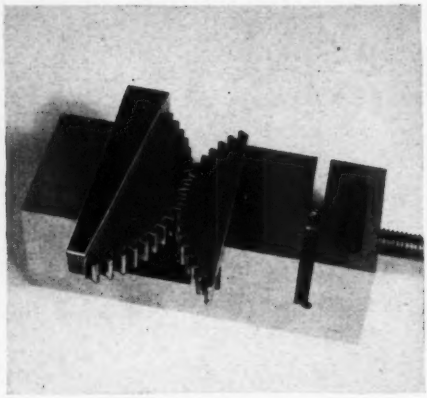


Plate Keeps Gear Data. It's easy to forget what change gears are on a lathe—or, on a quick-change lathe, whether metric or regular gears are in place. An aluminum plate on which you can jot gear changes in pencil will keep you posted on what is set up.

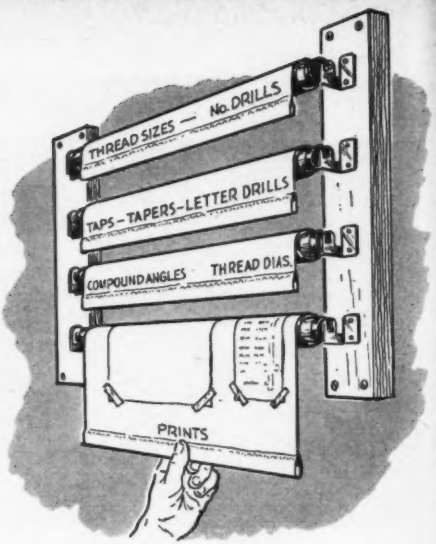
Engrave or stamp gear designations on the plate. Make a matte writing surface with fine abrasive cloth or abrasive powder. Mount under any convenient bolt.—*Walter E. Burton, Akron, Ohio.*

Please turn the page for more shop tips

More Shop Tips

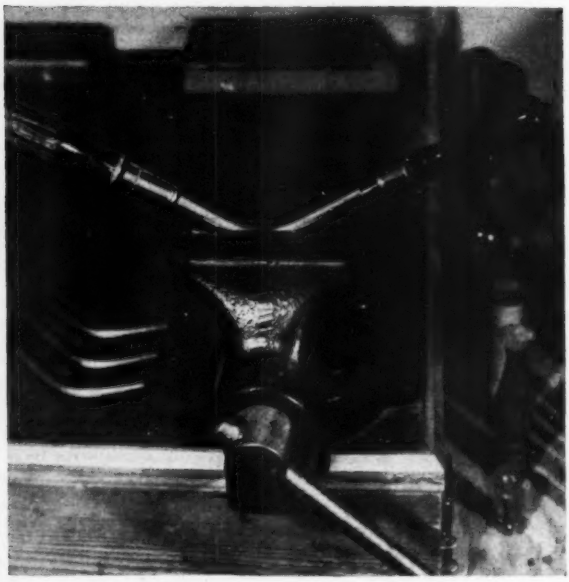


Gear Segments Grip Tapers. One of the handiest vise accessories I have in my toolbox is a pair of segments that were cut from a thick spur gear. Placed between tapered work and the movable vise jaw, they automatically roll into position as the jaw is tightened and clamp the taper. They hold all sorts of tapers, even round ones such as lathe centers, and can be used in any machine or bench vise.—*H. J. Gerber, Stillwater, Okla.*



Shop Charts Roll Up. Reference charts or blueprints are neatly stored in small space on a roll-up rack like this. Cut old roller shades to uniform length. Mount them directly on a wooden wall, or on pieces of wood for fastening to masonry.

Tape the reference sheets to the shade cloth. Mark the contents of each roller on the outer turn or on the mounting board. For use, simply pull down the roller.—*Randolph Lucas, Richmond, Va.*



Tube-Bending Tip. To make a smooth bend in a small piece of copper tubing without first filling it with sand, use your vise. Clamp the piece horizontally, tightening the jaws just enough to hold it. Insert screwdriver shanks, keeping the tips well away from the bend. Then grasp the screwdriver handles and put one thumb down where the bend is to be formed. Bend up with both hands. Properly adjusted, the vise jaws should let the tubing bend but not spread or buckle. With longer pieces of tubing, you won't need screwdrivers.—*Hall Taylor, Santa Rosa, Calif.*

How to Make Your Satellite Spotter

This sturdy mount will enable amateurs to track artificial moons with ordinary binoculars.

By Harry Walton

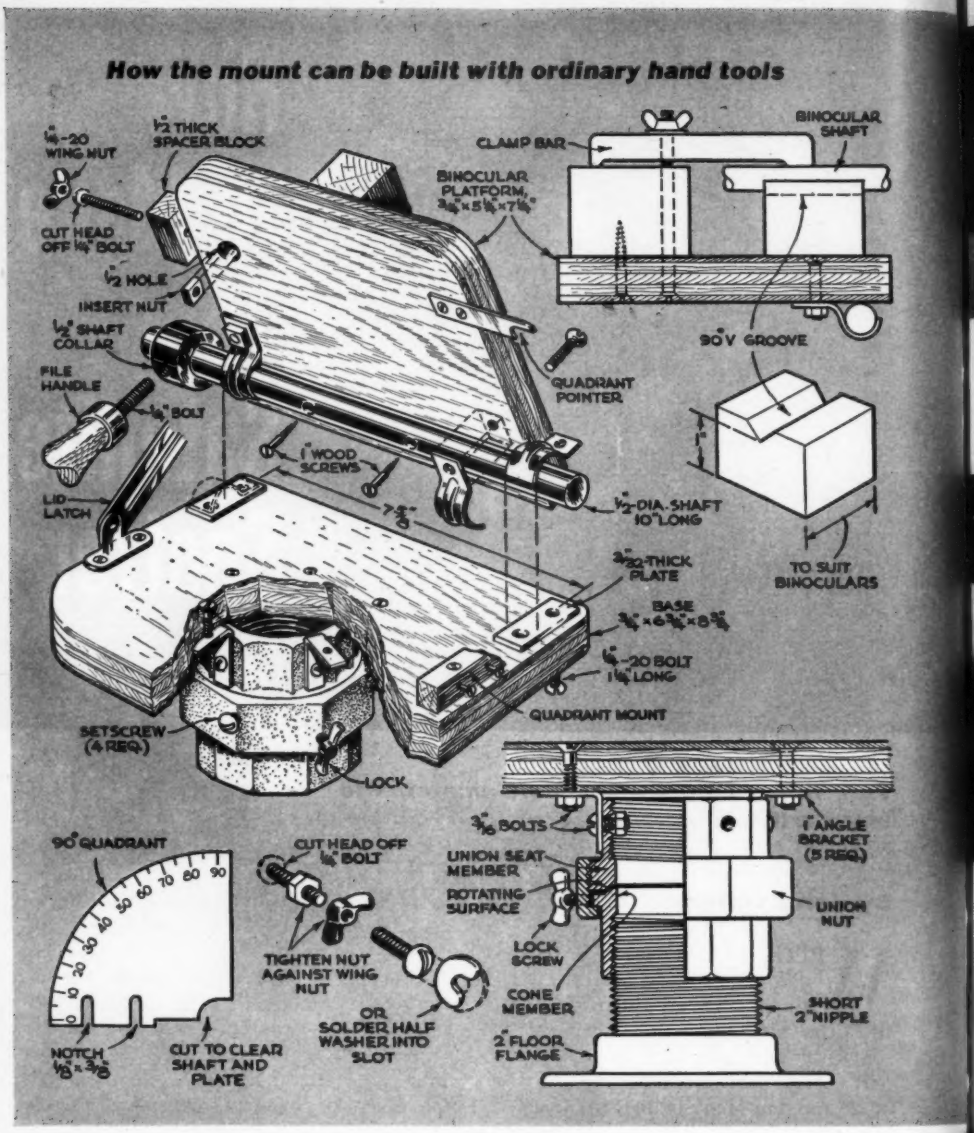
WITH a binocular stand that you can make mostly from pipe fittings, you can get ready now to spot the artificial earth satellites that scientists are planning to launch.

It's even possible that you—or some other amateur—may be first to see a satellite after it is fired. Although its course is precalculated and batteries of elaborate cameras will be trained on it, it could plunge into a different orbit than the planned one. Should this happen, it may not pass within sight of the official observing stations. Amateur spotting might then be the only means of tracking the satellite visually in its early orbits.

Why build it now? Experts in charge of tracking the satellite want the help of amateurs. Says Dr. Fred L. Whipple, Director of the Smithsonian Astrophysical Observatory, "The importance of amateur astronomers in the project can hardly be overestimated."

But to find, identify and follow a tiny object moving at 18,000 m.p.h., hundreds of miles up, you will need practice. Now is the time to start getting it. You'll be able to make yourself a trained observer by watching stars, following planes and tracking free balloons if you equip yourself properly now.

Binoculars will show it. To get a spectator's seat for man's first venture into space, you need no costlier optical equipment than a pair of 7 x 50 binoculars (PSM, May '56, p. 110). But because



the tiny man-made moon will be moving fast—it will pass through the binocular field in seven seconds—some means of holding the glasses as steady as possible is an absolute must.

Of course this support has to be movable, so that the binoculars can be trained on the right sky area and swept to follow the target as it swings on past.

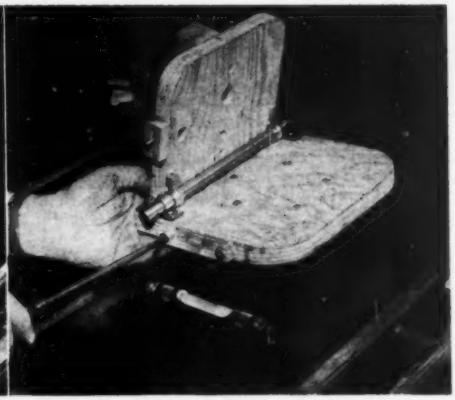
The PSM spotting mount shown above is easy to build from common pipe fittings and hardware parts. To make it, you need only hand tools—plus a single ¼"-20 tap (available in dime stores) and a tap wrench. No machining is necessary.

Besides holding the binoculars steady,

CUT SHORT BITS of solid wire solder and drop one under each setscrew. This protects the union threads on which the screws clamp. The knurled lock screw shown was from an old casement lock, but a wing screw could be used. Mount union seat on the base with brackets.

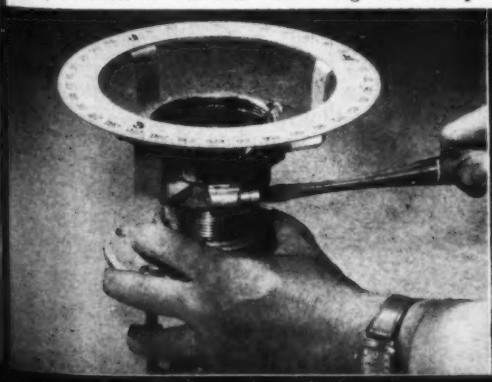
TO GET BASE EXACTLY LEVEL, put the union seat on a flat surface and check height of the corners of the base with a pencil clamped to a square, using paper under the pencil point. Then loosen the bracket screws and adjust the base until all of the corners check out at an equal height.

TILT SHAFT TURNS in heavy-duty BX clips on top of iron rub plates. Level a flat surface accurately. With the union seat on it, place a level on the shaft as above (only one level is needed). If shaft is not level, shim up the low end with tin-can strips under the rub plate.



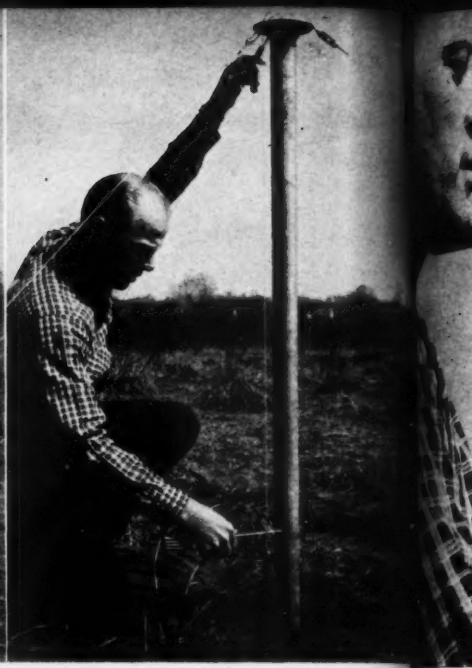
TURN THE BASE at right angles on the same leveled surface and fasten a line-level bubble to the right-hand edge, adjusting it to read level. Twist a ¼"-20 bolt into a file handle and tighten it into a shaft collar as in the drawing to bear on a flat filed on the shaft.

BEND THREE BRACKETS from stiff brass or aluminum to lie against flats on the lower union member and hold the compass ring ¼" below the base. Drill ring-mounting holes oversize for 6-32 screws to allow adjustment. Fasten the brackets to the flats with a big hose clamp.



ASSEMBLE THE UNION, a short pipe nipple, and a 2" floor flange. Screw a second flange onto the pipe post. Place a rubber ball between and join the flanges with 3/16" bolts (three in six-hole, four in four-hole flanges), with two nuts between flanges and a wing nut below.

DRIVE THREE STAKES around spot chosen for the post, set it into the hole, and rig wires to the stakes from turnbuckles hooked into flange holes. Adjust length of the wires to hold post reasonably plumb with turnbuckles slack. Fill hole around post with stones and cement.



SUSPEND A PLUMB BOB from one flange hole and measure distance from post to cord at the top. Then adjust turnbuckles (while cement is still soft) to bring cord equally distant from lower part of post. Check by repeating with plumb bob hanging 90° around from first position.

this mount allows them to sweep a full 360° horizontally and to tilt upwards to 90°. Both of these movements are smooth and free of play. An azimuth ring will give you horizontal bearings relative to true north. A quadrant will read vertical angles of elevation. With these, you should be able to find the satellite's position. Maps showing when and where it can be seen in your vicinity will probably be printed in newspapers.

The original PSM spotting mount shown on these pages has been examined by Dr. Whipple. It is, he says, "an ingenious and practical means of equipping the amateur for effective satellite observation."

Post and all, the parts should cost no more than $12 or $13 if bought locally. You can shave this figure by using secondhand pipe or lumber for the post. Most of the parts are also available from general mail-order houses.

It turns on a union. The horizontal bearing is formed by the ground sealing surfaces of a 2″ pipe union. This fitting consists of three parts. Two are threaded to screw onto meeting pipes.

The third part is a big ringlike nut that seats against a flange on one part and screws onto the other, thus pulling the two together. Fitted with setscrews, this nut can be locked at a point that leaves the sealing surfaces free to turn, but without wobble.

Punch-mark four corners (not flats) of the union nut ¼″ from the end of the thread. Drill No. 7 holes on the marks and tap the holes for ¼″-20 screws. Lubricate the tap and turn it in slowly, taking particular pains to start it parallel to the drilled holes.

Take only about half a turn at a time, backing out a trifle each time to free the chips. Tap all four holes right through the wall of the nut.

Drop the coned member into the nut. Then, with a depth gauge or a strip of paper, measure the depth at which the rim of the cone rests in the nut. Punch-

MOUNT THE HEAD with compass ring zeroed on due north. Turn wing nuts to center the bubble (ball provides springy support for adjustment). Rotate head 90° and level again. Recheck first position. With head leveled both ways, tighten nuts on top of lower flange.

COMPASS RING projects slightly beyond the base. File a piece of brass to a point, bend as required, and fasten it to the edge as a pointer. Or attach a flat piece of clear plastic, with an indicator line scratched on it, to the underside of the base as shown in the picture above.

mark a corner of the nut (between two setscrew holes) ⅛″ below this point. Drill and tap there for the screw that will lock the horizontal movement.

Mount base with brackets. Hold a 1″ angle bracket against one flat on the union member that has a beveled bronze seat. Mark through the hole in the bracket. Then place the beveled seat down on a flat, smooth surface such as a piece of plate glass, part of a flat auto windshield, or a circular-saw table.

With a pencil clamped to a block of wood or a try square, mark every other flat at the same height as the first. Punch the center of the five flats on these marks. Drill ¼″ holes and attach 1″ brackets with $\frac{3}{16}$″ bolts and nuts. (The holes in the two legs of the brackets may be differently spaced, so compare them and mount matching legs to the union.) Draw diagonals on the wood base, center the union where they cross, and spot through holes in the brackets for bolts to fasten

Satellite Model Now Being Shown in Department Stores

A FULL-SIZE model showing how an earth satellite may look, built by a member of POPULAR SCIENCE MONTHLY's staff, is being shown now as part of "The American Dream Historical Pageant." This pageant is touring the United States this summer. It can be seen June 4 at the Bon Marche store in Seattle. It will arrive for display at the L. S. Donaldson Co. store in Minneapolis on June 11; at The Emporium in St. Paul on June 18; at Younkers in Des Moines on June 21; at Gold's in Lincoln, Neb., on June 25; at the Brandeis store in Omaha on June 28; and at the Younkers-Davidson store in Sioux City, Iowa, on July 2.

them. Drill, countersinking on one side.

Platform tilts up. Cut another piece of plywood to mount the binoculars on. To secure, cut a hardwood block as in the drawing. Saw a 90° notch in the top of it for the center shaft of the binoculars to lie in. Glue and screw this notched block to the platform.

Put the binoculars in to locate a second block, with a long ¼"-20 bolt passing through it for a clamp nut. Shape a hardwood clamp bar to bear on this block and pinch down on the center shaft of the binoculars.

IN HARVARD OBSERVATORY, PSM's binocular mount is studied by Dr. R. E. McCrosky, Research Associate.

As an alternative, you can buy a clamp made for holding the glasses on a camera tripod.* Costing $2.50, it ought to be a cinch for you to mount, requiring only a ¼"-20 bolt through the platform.

You may find that the glasses can be seesawed in the notch even with the clamp tight. This should have no effect on sighting, but it can be eliminated by fitting blocks under the barrels. Size these blocks to hold the eyepieces at your own eye spacing.

Cut a piece of ½" shafting 10" long and fasten it to the platform with two wood screws and two heavy-duty ½" BX clamps held by ¼" bolts. Pivot it on the base with two more bolted clamps and two iron plates cut from a thick angle bracket.

Set these clamps close enough to the first ones to prevent end play. File a bevel on the plywood if necessary to clear the plates and allow the platform to tilt fully 90°. Mount a cabinet-lid support as shown to lock the platform at any desired elevation. (This will be helpful if you and your friends cooperate by forming a team to spot satellites, but it may be omitted.) On the other side, fasten a small cleat to hold the elevation quadrant.

Fitting the scales. You can lay out an azimuth ring marked off in 360° divisions on plastic, metal or cardboard with a protractor. An 8", 360° drafting protractor made of plastic can be had for about $3. Or you can purchase the ring and the quadrant together, made of aluminum, by mail for about $2.50.* Notch the quadrant edge as in the drawing to mount it with wood screws and washers; the intersection of its 90° angle should be dead on the tilt-shaft center.

Grease the rotating surfaces of the union joint, assemble it, and tighten the nut to make it turn rather stiffly. Use care in drawing up the setscrews; pulling one or two up hard can distort the nut and cause sloppiness in the pivot. Tighten all four a little at a time until snug.

Drive a long, thin brad into the rear edge of the base so that the end lies just above the edge of the azimuth ring. Then swing the mount about, adjusting the ring until the nail runs concentric to it.

Setting up the mount. Making allowance for the leveling head shown, the post should be high enough to bring the binocular-eyepieces slightly above your eye level (making it easier to use them tilted up). Set the 2" pipe into concrete and plumb it as in the photos. END

**Azimuth ring, quadrant, and binocular clamp available from Floyd McGuckin, 314 N. Monroe St., Ridgewood, N.J.*

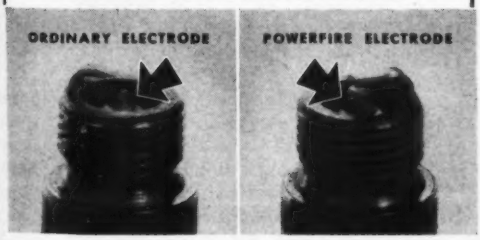
"The attempt to launch the earth satellite represents man's most important scientific venture in recent time," says Dr. Lloyd V. Berkner, president of Associated Universities, Inc., which operates the Brookhaven National Laboratory for the U.S. Atomic Energy Commission. For further news of this exciting project, and how you can take part in it, see future issues of POPULAR SCIENCE MONTHLY.

24% more road horsepower—for the straightaway!

Quicker starts, too—39% quicker!

-it can increase road horsepower by 24%!

SEE HOW MUCH BETTER AND LONGER NEW CHAMPIONS STAND UP IN TODAY'S HIGH-POWER ENGINES



New Powerfire electrode makes the difference! Both of these spark plugs have been subjected to identical use in a modern high-compression engine. You can see the old style electrode **(left)** is badly pitted and burned away. Plugs like that in your car often misfire . . . waste power and gas. Champion's new Powerfire electrode **(right)** is still able to give many more miles of powerful, economical performance.

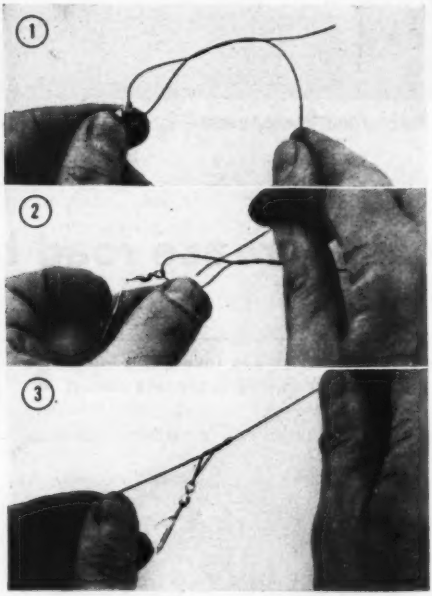
Base of Old Tires Protects Lumber Pile

ONE way to keep lumber off the ground, where it absorbs moisture, is to stack it on a row of old tires. This lets air circulate under it.—*Alexander Owen, Schenectady, N. Y.*

Pillbox Dispenses Stamps

STAMPS roll out of this dispenser (above) made from a plastic pill container. Cut the slit in the side with a sharp knife heated over a flame for a few seconds. If you have one of the taller bottles, several different rolls will fit.

▶▶▶WHEN filling plasterboard joints, I find that a thin coating of glue size between applications of joint cement gives me a smoother finish. The size stops absorption of moisture by the first layer and makes the second coat easier to spread.—*L. Ciomei, Chicago.*



Simple Knot Holds Fishline

ONE of the easiest knots to tie is also one of the best to hold a hook, lure or leader on a fishing line. Put the end of the line through the eyelet and wind it three or four times around the main line (1); insert it through the loop (2); pull tight (3). Snip off the excess.—*George C. Mattis, Birchwood, Wis.*

Men with mechanical skills:

measure yourself against this yardstick

Mechanics Creed

Upon my honor I swear that I shall hold in sacred trust the rights and privileges conferred upon me as a certified mechanic. Knowing full well that the safety and lives of others are dependent upon my skill and judgment, I shall never knowingly subject others to risks which I would not be willing to assume for myself, or for those dear to me.

In discharging this trust, I pledge myself never to undertake work or approve work which I believe to be beyond the limits of my knowledge; nor shall I allow any superior to persuade me to approve aircraft or equipment as airworthy against my better judgment; nor shall I permit my judgment to be influenced by money or other personal gain; nor shall I pass as airworthy aircraft or equipment about which I am in doubt, either as a result of direct inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily.

I realize the grave responsibility which is mine as a certified mechanic, to exercise my judgment on the airworthiness of aircraft and equipment. I, therefore, pledge unyielding adherence to these precepts for the advancement of aviation and for the dignity of my vocation.

This challenging creed has made the U. S. Air Force the finest technical service in the world. If you are a man who feels a deep sense of satisfaction from the knowledge of a job well done, the U. S. Air Force offers you a rewarding and exciting life. Skills you acquire in the Air Force will help you choose and succeed in your future career.

YOU GO PLACES FASTER ON THE ALL VOLUNTEER TEAM

THE U. S. AIR FORCE

M-45-P82

Paste Coupon on Postcard and mail to

Airmán Recruiting Information Branch
Box 2202
Wright-Patterson AFB, Ohio

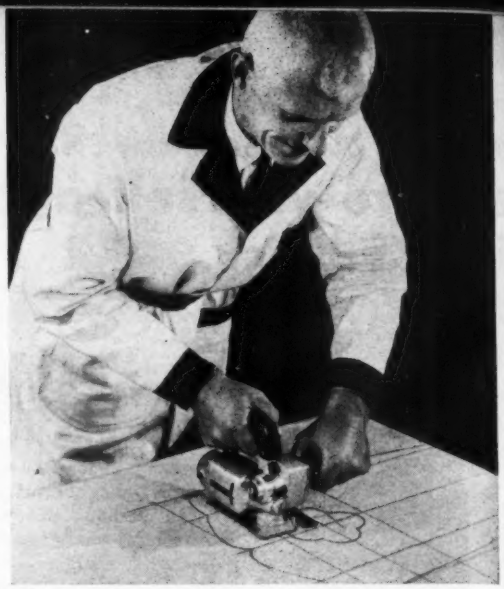
Please send more information on my opportunities for enlisting in the U. S. Air Force. I am between the ages of 17-34 and reside in U. S. A. or possessions.

Name_____

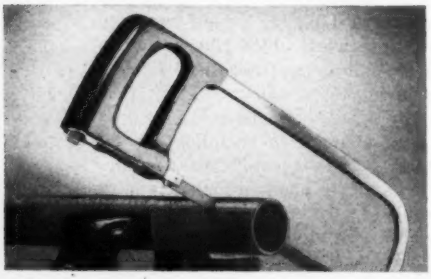
Address_____ Age____

City_____ Zone____ State____

New Tools

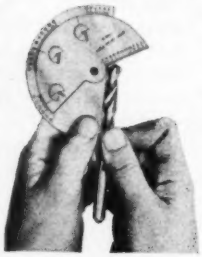


1. Jigsaw Moves in Orbit. The blade on this portable saw cuts only on the upstroke, releases and then backs away on the downstroke—resulting, the maker says, in less blade breakage and extended sharpness. In addition, you can plunge cut without drilling a starting hole and saw through a full 2″ in wood, ¾″ aluminum or ¼″ steel, and also cut plastics. An accessory base that is available lets you do angle cutting.



2. Hacksaw Molded in One Piece. A plastic handle molded directly onto the steel frame makes this a durable hacksaw for use in close quarters. It takes a 10″ or 12″ blade and has a lever-lock.

3. Gauge Checks Drill Point. Here's a drill point gauge that takes the guesswork out of drill sharpening and permits quick selection of the right drill. Two calibrated semicircular disks enable you to measure any cutting angle from 110° to 135°, point angle from 40° to 90° and clearance angle from 0° to 20°. Also included are a point center scale and illustrations that show how to use the gauge for checking angles.



4. Preground Lathe Bit. A chip groove and a hollow-ground side run the full length of this bit. Hence it can be used as a right- or a left-hand tool simply by turning it around. When dull, only the end is ground. It may be mounted in any holder or directly in the tool post. Both standard and heavy-duty bits are available in all sizes. A ¼″ alloy-steel bit is shown in the hand in the photo at left, and a ⅜″ industrial bit in the four-position tool post.

More information *about the tools shown on this page can be obtained from: 1. Porter-Cable, 69 Exchange St., Syracuse, N.Y.; 2. Clemson Bros., Inc., 20 Cottage St., Middletown, N.Y.; 3. Swanson Mfg. Co., 1236 Sherman Ave., Evanston, Ill.; 4. Tool-Craft Co., 109 Harvey St., Hackettstown, N.J.*

Texaco Tips On Car Care

★ How to check your shock absorbers

Because shock absorbers are so vital to driving comfort — as well as control of your car — it's a good idea to check them regularly. Step on your car's bumpers and press down hard — as far down as they go. When you let go, the car should come up smoothly and rather slowly. If it bounces up sharply or vibrates up and down, your "shocks" should be either repaired or replaced.

THINKS FOR ITSELF!

★ How to increase engine life, driving economy

Use *Havoline Special 10W-30*, the all-temperature oil. When you start 'er up, it's *light* — for flash lubrication, fast getaways. Yet when your engine heats up, it has *body* — for protection against sizzling engine heat. Yes, *Havoline Special 10W-30* thinks for itself . . . saves you thinking about seasonal grades of oil. So change today, change regularly. Get *Havoline Special 10W-30* from your Texaco Dealer, *the best friend your car has ever had!*

TEXACO

TEXACO DEALERS IN ALL 48 STATES

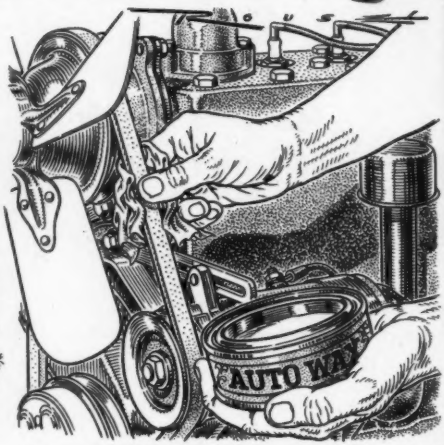
Texaco Products are also distributed in Canada and in Latin America

THE TEXAS COMPANY

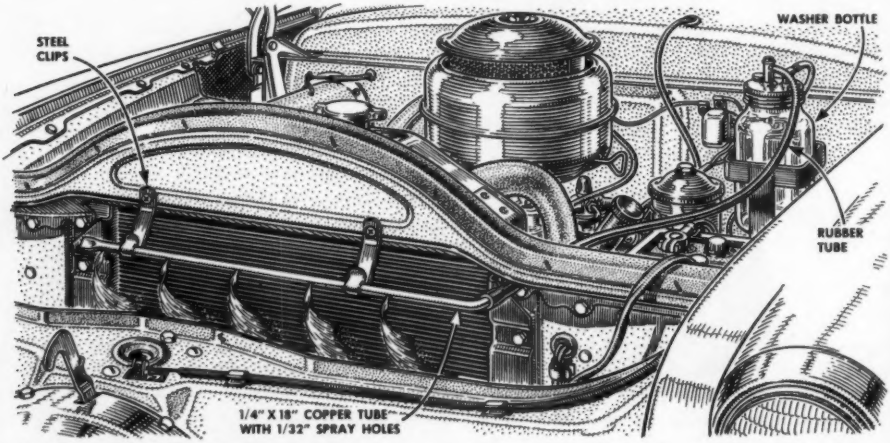
TUNE IN: TEXACO STAR THEATER starring JIMMY DURANTE, on TV Saturday nights, NBC.

Hints from the Model Garage

A handy hook like this will keep the floor mat out of the way while a mechanic is servicing a master cylinder that is located underneath the floorboard. The hook will also help to prevent crimping and breaking of the floor mat.



Fan belt squeak? One man who had been trying to quiet his for five years offers this tip: Use just a little auto paste wax on the inside surface of the fan belt. The wax doesn't seem to cause any noticeable slippage, he says.



A long pull on a mountain grade may cause an engine to overheat when you are towing a trailer. Spraying the radiator like this will help keep the temperature down. Drill five $\frac{1}{32}''$ holes in an 18" piece of $\frac{1}{4}''$ copper tubing. Fasten the tubing to the radiator shroud with steel clips. Connect the spray tube and the outlet of the windshield-washer bottle with rubber tubing. Squirt water on the radiator each time that the temperature creeps too far above the normal heat range.

Please turn to page 208 for more auto hints

SIX TANK TRUCKS of oil surge through your AC OIL FILTER every 5000 miles!

Here are the FACTS about the miraculous job done by a full-flow AC OIL FILTER

Every 30 seconds your car is running, all of the oil in the crankcase takes a cleaning trip through the oil filter. The magnitude of this filtering job – removing damaging bits of dirt, metal, grit and carbon from the equivalent of 36,000 gallons of oil every 5000 miles—calls for the qualities that are built into AC Oil Filters. Huge filtering area, specially processed filtering material and parallel packing of AC Oil Filters insure efficient, protective filtering over every mile of the recommended period between filter changes. You make a change for the better when you change to AC.

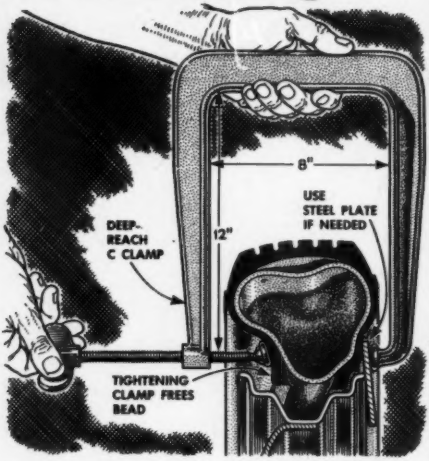
Watch WIDE WIDE WORLD and BIG TOWN • NBC-TV

AC OIL FILTERS

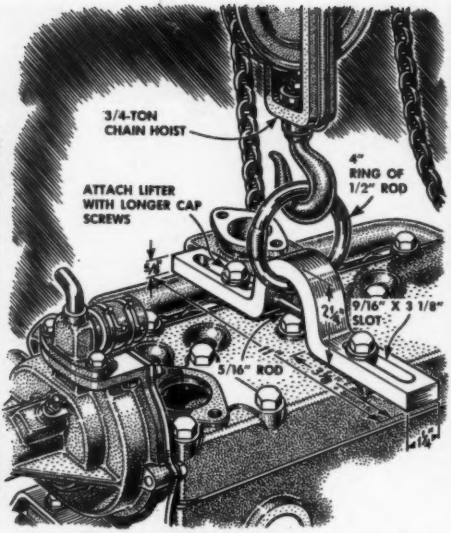
GM GENERAL MOTORS

AC SPARK PLUG THE ELECTRONICS DIVISION OF GENERAL MOTORS

More Hints from the Model Garage



Bead stuck when you start to demount a tire? Here's one way to remove it—if you have or can borrow a deep-throated C clamp of about the dimensions shown. With clamp in place, turn screw to free one side. If the second side remains stuck, use a steel plate as in the drawing.



A universal engine lifter is what its developer calls this useful shop accessory. Slots make it possible to attach the lifter to a variety of engines: Merely replace two cap screws with longer screws. The lifter was bent to the desired shape from a bar of ⅝"-by-1¼" steel stock.

Evaporated milk is part of the stock in trade of one garage man. Poured into a radiator, it often stops small leaks. If the leak continues, the mechanic concludes that a radiator repair job is needed.

Do you use a polishing cloth on frequent occasions between washings to keep your car spotless? Drape it over a chrome towel ring mounted (with sheet-metal screws) in the luggage compartment.

10-to 12-pt. Disstons recommended for smoothest cuts in plywood and other well-seasoned woods

When you're cutting plywood and want a beautifully smooth finished edge, you've got to use a saw that's made for finished work.

That's a 10-, 11-, or 12-point Disston. These fine-toothed saws often make the difference between fine workmanship and an ordinary job. They are specifically designed to be used for finishing.

So if you've been trying to cut plywood or other well-seasoned woods with an 8-point saw, ask at your hardware or tool store for a Disston D-23 in 10-, 11-, or 12-point. You'll get a saw of fine tool steel, with perfectly tempered and double taper ground blade . . . a saw you'll use and treasure for a lifetime.

CARLSON
STEEL TAPE RULES AND TAPES

WHITE CHIEF (6 ft.) $1.80 — BIG CHIEF (12 ft.) $3.50 — STAR CHIEF (25 ft.) $4.00

Finest quality long tapes and pocket-size rules for every purpose. From 6 feet to 100 feet. Accurate, easy-to-read. Double graduations, feet and inches. Stiff, rigid, easily-changed blades. Easy-action swing tips.

DISSTON DE LUXE
CIRCULAR SAWS AND DADOS
from $2.25 to $22.80

CUT-OFF — PLANER — COMBINATION — DADO

Make cutting easy and accurate. Made of famous Disston steel. High finish; keen teeth; accurate fitting. Special styles to fit all makes of bench and portable electric hand saws.

FREE ILLUSTRATED BOOKLET! 64-page Disston Saw, Tool & File Manual. Tells how to choose and use tools; how to care for them. Helpful hints on wood working, metal working and selection of materials. Write today for your free copy.

ASK YOUR HARDWAREMAN TO SHOW YOU THESE FINE DISSTON TOOLS

DISSTON HKP

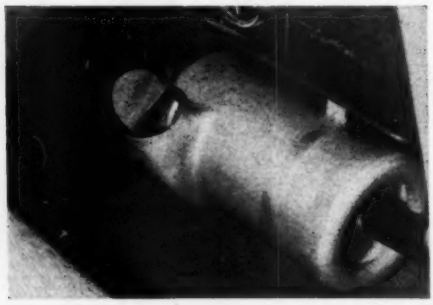
Henry DISSTON DIVISION • H. K. PORTER COMPANY, INC.
610 Tacony, Philadelphia 35, Pa.

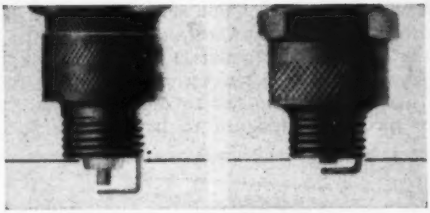
New for Your Car

1. Clear-Plastic Covers Fit Snugly. Made of vinyl and tailored in several sizes to fit various makes, these covers let upholstery of your car show through while protecting it. They require no tacking down; you need only pull them on. They come for split or solid-type seats.

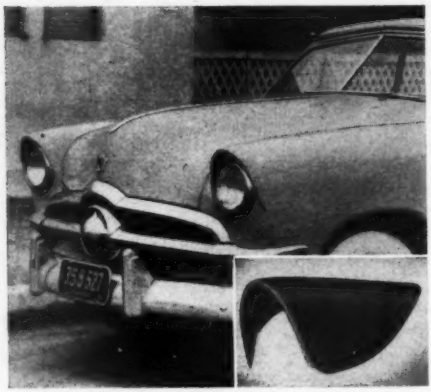
More information *about these new car products can be obtained from: 1. Sta-Dri Products Co., 147-47 Sixth Ave., Whitestone 57, N.Y.; 2. Kool Engineering Corp., 3716 W. Belmont Ave., Chicago 18; 3. Electric Auto-Lite Co., Toledo 1, Ohio; 4. California Custom Accessories Manufacturing Co., 301 W. Jefferson, Los Angeles 7.*

2. Air Conditioner Comes in Kit. You can mount the blower of a new air conditioner under the dash (below) or in the trunk of most 1951 to 1956 cars. The compressor unit goes under the hood. Rubber-hose connections help make it an installation job that you can do yourself. Cool air can be directed by adjusting louvers in the 13½"-long blower.





3. Spark Plug Has Long Tip. The long tip of this plug (left) is said to improve burning, putting the spark nearer the center of the fuel mixture than other designs (right). It is for OHV engines.



4. Hoods Modernize Fenders. The hooded headlights of 1956 models can be imitated on many Fords, Chevvies and Mercurys dating back to 1949 with the steel extension "eyebrows" in the inset at right. They are welded or brazed to the fenders, and painted to match.

Model 157
Porter-Cable *quality* in a professional 7¼″ saw with blade on left. Light in weight—only 13 lbs. complete. Ball bearing construction throughout—instant depth and bevel adjustments, telescoping guard, powerful 12 amp. universal motor, exclusive Kickproof Clutch—only $89.50. In handy kit with accessories, only $104.50.

Model 528 Speedmatic.
World's finest professional saw. Extra speed and power for extra-heavy duty—perfect balance for easy, all-day use. 8¼″ blade with new telescoping guard and exclusive Porter-Cable Kickproof Clutch—new calibrated depth gauge, instant bevel adjustment, new handle design with built-in trigger switch. Full ball bearing construction for long, troublefree service. $130—in kit form with accessories, $145.

Special Introductory Offer on Model 146. Save $12.00 when you buy the rugged 6½″ Model 146 Saw in handy kit form. Kit includes saw, rip guide, protractor gauge for all straight or angle cut-offs, and a strong steel carrying case. Regularly $87.75—now only $75.75! Offer expires July 30, 1956—See your Porter-Cable dealer *now!*

Porter-Cable
Quality Electric Tools

PORTER-CABLE MACHINE COMPANY • 6156 N. Salina Street, Syracuse 8, New York
SAWS • DRILLS • SANDERS • ROUTERS • SHAPERS • PLANES

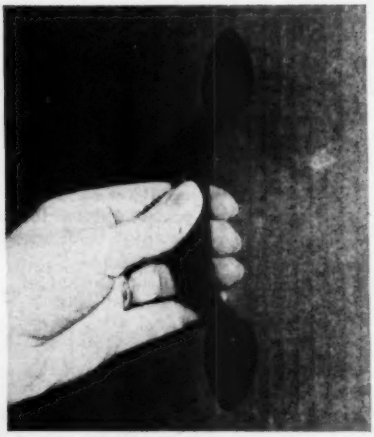
In Canada: write Porter-Cable, Ltd., Box 5019, London, Ont. Canadian prices slightly higher.

Three Sailors Put Their Hi-Fi Amplifiers on Bread Pans

SEEKING inexpensive chassis on which to mount hi-fi amplifiers, these three sailors cooked up the novel idea of using baking pans. They found that 90-cent bread tins worked out fine for their basic power-amplifier units.

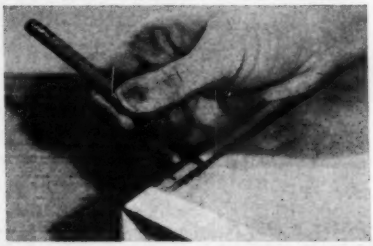
The trio, left to right, Radiomen Nicholas Milano, Willis B. Rush and Bobby J. Brittain, are stationed on a naval air base in Hawaii.

DO IT THE EASY WAY



HANDWROUGHT HARDWARE can be simulated by painting plain pulls black and putting them over shaped hardboard.

STICKING STEEL DRAWERS can be freed by rubbing sliding parts with pencil point.

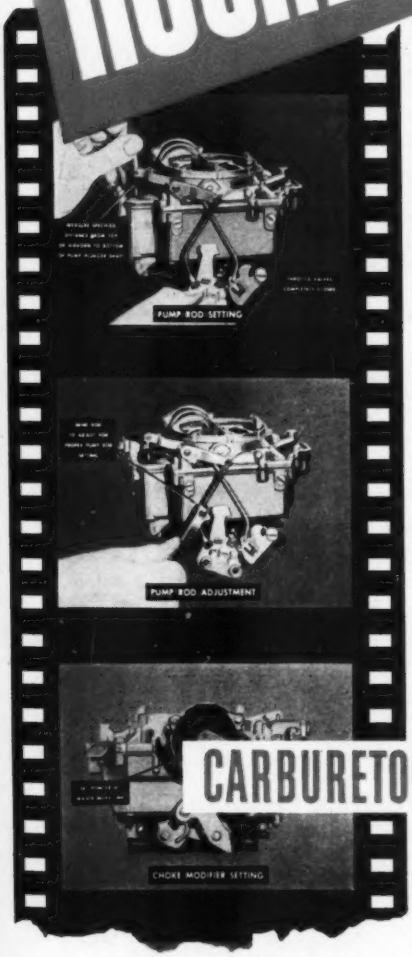


TO SIPHON GAS without getting any in your mouth, use an ear syringe to start. Squeeze syringe, insert in tube, release.

PAINT A CHAIN in a paint can for a fast job without cleanup. Suspend the chain from a rubber band and dip it in paint.

Carburetor Service is a Science . . .

ROCHESTER PRODUCTS



College of Carburetor Knowledge . . . Ready to Serve You!

Higher learning means higher earnings! You can't stump the experts on carburetion service. But *you* are the expert when you finish the complete course now being offered at GM Training Centers throughout the country. Factory-trained technicians, using up-to-date methods and materials, teach you the fundamentals of today's highly specialized carburetor design . . . the fine points of service that make you master of Rochester Carburetor jobs. Take advantage of this opportunity to *learn more* . . . and *earn more!* Write the United Motors Service distributor in your area for further information, *today!*

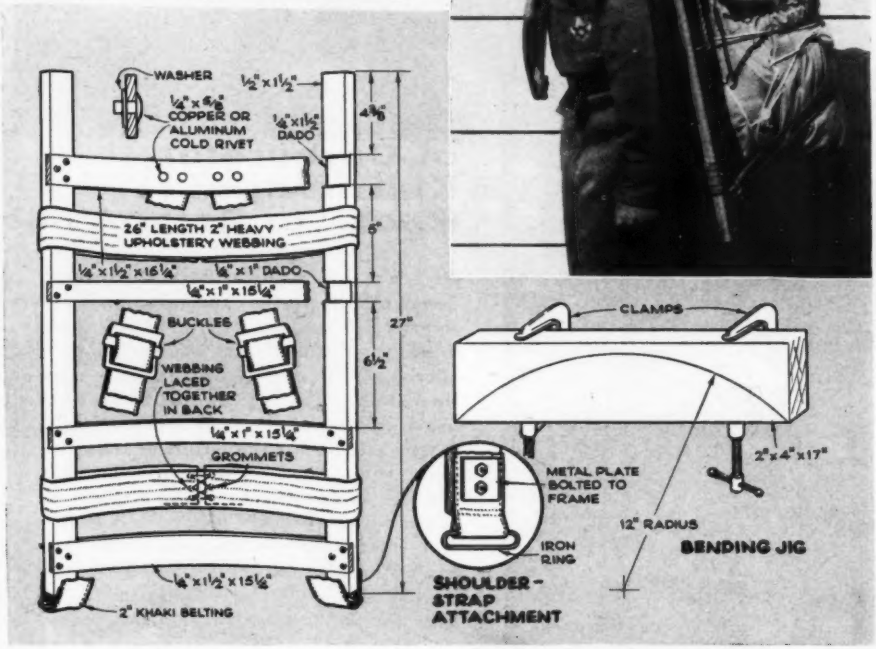
ROCHESTER PRODUCTS DIVISION
GENERAL MOTORS CORPORATION, ROCHESTER, N. Y.

CARBURETORS BY ROCHESTER PRODUCTS

Pack Frame Eases Camp-Gear Load on Junior's Back

ANY young hiker will enjoy toting his pack on this sturdy frame made of oak or birch. You can bend the crosspieces in jigs like that shown. Soften the wood first by boiling it in water. If big clamps are not available, tighten the jigs in a vise and nail cleats near the ends. Let the pieces dry in the jigs for about a week; then assemble with screws.

Sand and shellac the frame, attach screw eyes, webbing and shoulder straps.



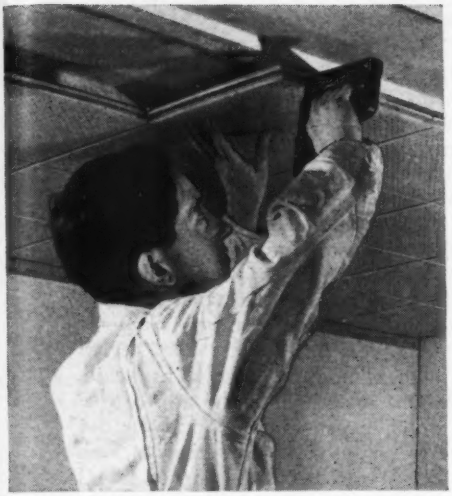
Circle Stamp Made from Hose

A STAMPED circle will highlight a printed section that you want to get some special attention.

The stamp is a piece of rubber hose cemented to the end of a short length of dowel. Let a fraction of an inch of hose project. Anchor with a screw or pin.

Putty Ring Protects Can Lip

PAINT, glue and similar materials will harden in the groove in the lip of a can and prevent a tight seal. You can avoid this annoyance by stuffing a ring of putty in the groove before pouring. Lift the putty out to replace the lid.



Put up ceiling tile with a Bostitch T5-8 Tacker with Bostitch 9/16" or 1/2" staples. Press nose of tacker firmly into cove formed by tile flange. Squeeze the lever. You can drive three staples 4" apart in about three seconds and go on to next tile. You never mar the face of the tiles, and you can wear gloves to keep them clean.

Apply insulation with either the Bostitch T5-8 Tacker or H2B Hammer, with Bostitch 3/8" staples. The hammer is faster with a little practice. You can drive staples with a flick of your wrist—*much* faster than hammer and nails. One hand is free to position the insulation. Ask your building supply dealer or Bostitch representative.

Best way to install ceiling tile and insulation

In co-operation with leading makers of ceiling tile and insulation, Bostitch has prepared a booklet which gives detailed instructions for installing these materials. The following firms have contributed information for this booklet and approve this method of installation.

Armstrong Cork Company	makers of Temlok® Tile, Temlok® Plank and Cushiontone®.
The Celotex Corporation	makers of Celotex Tile Board and Finish Plank and Celotex Regular and Reflective Rock Wool Blankets.
Infra Insulation, Inc.	makers of Infra Multiple Aluminum Thermal Insulation.
Minnesota & Ontario Paper Company	makers of Insulite Tile Board, Plank, and Interior Board.
National Gypsum Company	makers of Gold Bond Insulation Board Products and Rock Wool Insulation.
Reynolds Metals Company	makers of Reynolds Reflective Aluminum Insulation.
United States Gypsum Company	makers of Twin-Tile, Panel-Tile, Quietone, Auditone, USG Insulation Plank, and Red Top Insulating Wool.
American Sisalkraft Corporation	makers of Sisalkraft and Sisalation.
Wood Conversion Company	makers of Balsam-Wool and Nu-Wood Ceiling Tile.

Fasten it better and faster with

BOSTITCH®
STAPLERS AND STAPLES

FREE BOOKLET—*send coupon for your copy.*

BOSTITCH, 566 Mechanic Street, Westerly, R. I.
Please send me a free copy of your booklet on how to install ceiling tile and insulation.

Name _____

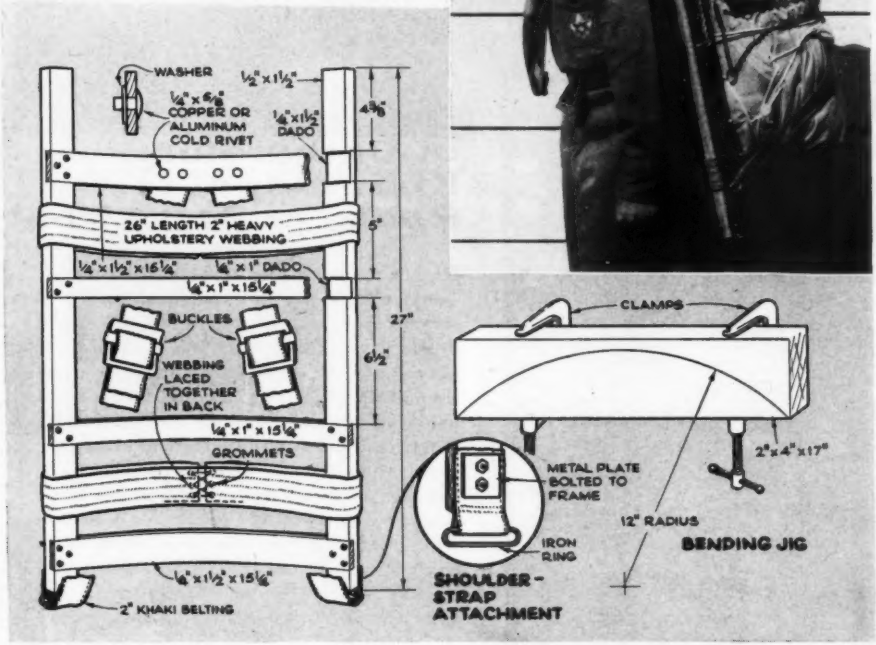
Address _____

City _____ *Zone* _____ *State* _____

Pack Frame Eases Camp-Gear Load on Junior's Back

ANY young hiker will enjoy toting his pack on this sturdy frame made of oak or birch. You can bend the crosspieces in jigs like that shown. Soften the wood first by boiling it in water. If big clamps are not available, tighten the jigs in a vise and nail cleats near the ends. Let the pieces dry in the jigs for about a week; then assemble with screws.

Sand and shellac the frame, attach screw eyes, webbing and shoulder straps.



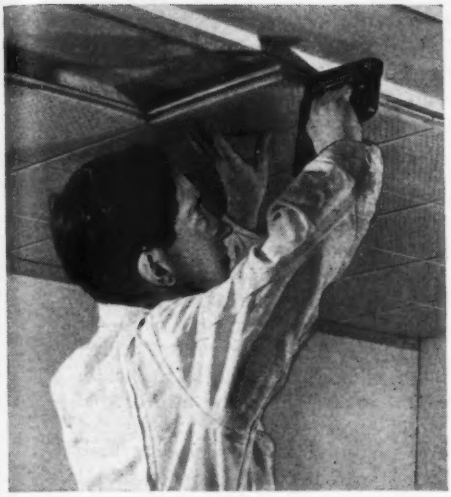
Circle Stamp Made from Hose

A STAMPED circle will highlight a printed section that you want to get some special attention.

The stamp is a piece of rubber hose cemented to the end of a short length of dowel. Let a fraction of an inch of hose project. Anchor with a screw or pin.

Putty Ring Protects Can Lip

PAINT, glue and similar materials will harden in the groove in the lip of a can and prevent a tight seal. You can avoid this annoyance by stuffing a ring of putty in the groove before pouring. Lift the putty out to replace the lid.



Put up ceiling tile with a Bostitch T5-8 Tacker with Bostitch 9/16" or 1/2" staples. Press nose of tacker firmly into cove formed by tile flange. Squeeze the lever. You can drive three staples 4" apart in about three seconds and go on to next tile. You never mar the face of the tiles, and you can wear gloves to keep them clean.

Apply insulation with either the Bostitch T5-8 Tacker or H2B Hammer, with Bostitch 3/8" staples. The hammer is faster with a little practice. You can drive staples with a flick of your wrist—*much* faster than hammer and nails. One hand is free to position the insulation. Ask your building supply dealer or Bostitch representative.

Best way to install ceiling tile and insulation

In co-operation with leading makers of ceiling tile and insulation, Bostitch has prepared a booklet which gives detailed instructions for installing these materials. The following firms have contributed information for this booklet and approve this method of installation.

Armstrong Cork Company	makers of Temlok® Tile, Temlok® Plank and Cushiontone®.
The Celotex Corporation	makers of Celotex Tile Board and Finish Plank and Celotex Regular and Reflective Rock Wool Blankets.
Infra Insulation, Inc.	makers of Infra Multiple Aluminum Thermal Insulation.
Minnesota & Ontario Paper Company	makers of Insulite Tile Board, Plank, and Interior Board.
National Gypsum Company	makers of Gold Bond Insulation Board Products and Rock Wool Insulation.
Reynolds Metals Company	makers of Reynolds Reflective Aluminum Insulation.
United States Gypsum Company	makers of Twin-Tile, Panel-Tile, Quietone, Auditone, USG Insulation Plank, and Red Top Insulating Wool.
American Sisalkraft Corporation	makers of Sisalkraft and Sisalation.
Wood Conversion Company	makers of Balsam-Wool and Nu-Wood Ceiling Tile.

Fasten it better and faster with

BOSTITCH®
STAPLERS AND STAPLES

FREE BOOKLET—*send coupon for your copy.*

BOSTITCH, 566 Mechanic Street, Westerly, R. I.
Please send me a free copy of your booklet on how to install ceiling tile and insulation.

Name _____

Address _____

City _____ *Zone* ____ *State* _____

Tiny Rooms Show U.S. History

[*Continued from page 98*]

dolls. She loved to make little rooms look real and livable.

So friends and relatives often gave Narcissa doll furniture and other tiny objects. But the furniture she got seldom matched the sizes of the rooms in her dollhouses. Resourceful and adept with her hands, she rebuilt the furniture to fit.

Her uncle was Rear Admiral Albert Niblack. From the far corners of the globe he brought her tiny china tea sets, little copper vases and urns, bits of decorative jade and porcelain, and other similar miniatures. Later, when Narcissa married the son of one of the founders of Montgomery Ward and became Mrs. James Ward Thorne, she too had the opportunity to travel extensively in Europe and the Middle East. On every trip she gathered together more tiny objects for her collection—which grew so large that she decided to construct miniature period backgrounds as artistic showcases.

At first she did the work herself, using jeweler's tools and dental instruments. Later, as the project grew, she employed a few skilled craftsmen to help her. To gather accurate information for her rooms she made trips both here and abroad, visiting historic houses and typical homes. Many of the miniature rooms and their furnishings are detailed copies of actual rooms that she saw.

For a dozen years, the miniature-room collection was shipped around the country as a circulating exhibit at world's fairs and museums. Finally, Mrs. Thorne presented the collection of rooms, with money for a fireproof, air-conditioned gallery, to The Art Institute of Chicago, where they are on permanent exhibit.

There are 37 rooms depicting American homes through the decades, and 30 reproductions of European rooms. Each is approximately 18 inches high, three feet wide, two feet deep. Nothing in any of the rooms varies more than 1/32 of an inch from the scale of one inch to a foot.

Although some of the tiny objects in the rooms are a part of Mrs. Thorne's collection of miniature objects, many of the furnishings had to be made. It was quite an accomplishment: Some of the rooms contain more than 100 tiny pieces of furnishing. One room contains 134.

To hold to the strict scale, rugs were handwoven, lighting fixtures and chandeliers were handcrafted by a New York jeweler, upholstery materials were specially made, wallpapers were made with small designs, even newspapers were printed up in microscopic type. Some of the miniature items took the skilled craftsmen as long as six weeks to create.

Realism is carried to the nth degree. The wood flooring in the rooms is not just a rectangle of wood scored to look like floorboards. It is made up of actual miniature boards, hand-cut to fit. In many of the early American rooms, the tiny boards are actually pegged down with pinlike wooden pegs. Doors aren't just prop doors painted on the walls, they are real doors that open and close. Even the windows work. In one American room a tiny ship-in-a-bottle model rests on the fireplace mantel. The bottle measures less than an inch in length!

Tiny pots and pans hang close by kitchen fireplaces. Miniature spectacles, and even half-finished pieces of knitting, complete with needles, rest on tables. Midget leather-bound books with actual pages fill the bookcases. Tea pots and dishes are set out ready for use.

To make the illusion even more complete, open doors allow you to look into the corners of other rooms and hallways beyond. In some cases, front doors are open to give you a view of a flowering garden, a picket fence, or a rural scene.

Although no accurate account of the actual cost of building and furnishing the rooms was kept, their value is estimated at more than a million dollars. That averages about $15,000 a room. END

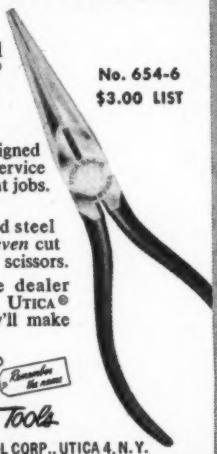
Bull's-Eye

A scientific type we know summed up the missile problem this way—"The Air Force should put less effort into 'missiles' and more into 'hittiles.' "—*Air Force Magazine.*

A Nose for Action

...Yes, there's real action in UTICA's® Long Chain Nose Cutting Pliers.

No. 654-6
$3.00 LIST



They're specially designed for year in, year out service on those hard-to-get-at jobs. And they stay sharp!

They'll cut tempered steel wire in a snap—will *even* cut paper like a pair of scissors.

See your hardware dealer today. Just ask for UTICA® No. 654 Pliers—they'll make your work easier!

UTICA® Remember the name Tools

UTICA DROP FORGE & TOOL CORP., UTICA 4, N. Y.

Red Devil

PUTTY KNIVES
WALL SCRAPERS
SPACHTLING KNIVES

P 13

P 1

Top-quality professionally-styled at prices to suit your pocket-book. High carbon, tempered steel blades — imported hardwood or tenite handles.

FREE How to Fix Broken Windows. Illustrated instructions on cutting and replacing window panes.

Red Devil Tools. Dept. 125
2400 Vauxhall Road, Union, N. J., U. S. A.
Please send FREE copy of "HOW TO FIX BROKEN WINDOWS."
NAME_____
ADDRESS_____
CITY_____ZONE_____STATE_____
1661

Pete Penn says:

"Best of Class...

"That's what automotive engineers say about motor oil made from *nature's finest crude*...Pennsylvania."

From crude to crankcase, every brand of Pennsylvania motor oil has outstanding *natural* advantages that make it *best for protecting and lubricating* today's high-speed, precision-fitted engines.

Take a tip from Pete Penn. At your next oil change, refill with a brand of Pennsylvania motor oil . . . available at good dealers around the world.

Today's BEST Oils
Start with Nature's Best Crude
...and that means Pennsylvania!

INSIST ON A BRAND OF

PENNSYLVANIA Motor Oil

©1956

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, Oil City, Penna.

[*Continued from page 144*]

membership moved out to watch Fred Pettigrew install a set of points.

GUS did not stay for the demonstration. He returned to the Model Garage, put on his work clothes and continued about his business.

Pretty soon Jack Bishop pulled in. His face was red. He was waving a copy of Philo Dittington's book.

"It's just as you said, Gus. This is a collection of nothing. The only chapter that tells anything at all is the one on installing points. The rest is just a lot of stuff about the Dittington principles."

"Good thing I didn't buy a copy," Gus said. "I'd be out a buck, too."

"But, Gus, you guaranteed them! You said they could get their money back at the Model Garage. What are you going to do?"

"Sit tight."

Jack exploded. "You should have seen the guy. While Fred was installing the points—and I suppose it was impressive to see him read the directions like a cook book and then do what it said and have it come out right—while Fred was working, the little Dittington guy moved around selling his book. I never saw anything so smooth. And what a line of chatter. Of course a big crowd gathered. He must have sold a hundred books. And plenty of those bottles of pills at two bucks apiece. When Fred had finished and he'd sold his last book, he stepped on the starter and the engine started as smooth as could be. Then he was off. That's when us suckers began looking at our merchandise."

Gus pointed down the road that came from the center of town. The first two or three of what soon developed into an avalanche of unhappy customers were bearing down upon the Model Garage. When the dust had cleared, Gus climbed up on an oil drum.

"Gentlemen and members of the fraternity of Do-It-Yourself," he began. The faces turned toward him were friendly because everybody in town trusted Gus.

"How are you going to get out of this pickle?" someone shouted. Gus joined in the laughter.

"You want your money back?"

"You bet we do! You said you'd give it to us!"

GUS held up his hand. "No, I didn't," he corrected. "I said you could get your money back at the Model Garage."

"What's the difference?"

"The difference is this: You'll get your money back at the Model Garage, but Dittington will give it to you. Mr. Do-It-Yourself is a fake—and he'll prove-it-himself."

"How do you know? We'll never see him again."

"I think you will," Gus assured them. "I figure it this way. When he left you, he did what any one of you would have done under the circumstances. He went around the corner to count his money. According to the crowd gathered here, that could take a long time." The crowd laughed. "About five minutes ago, he started his car once more, listened appreciatively to the sound of Fred's skillful work. In about two minutes or so, he will come chugging and spitting up the highway, and unless I miss my guess, will stall completely somewhere around the Model Garage."

Exclamations of disbelief greeted this last statement, but just then Jack Bishop called out: "Look what's coming!"

COUGHING and sputtering, the car containing Mr. Do-It-Yourself lurched along the street. With a final wheeze it stopped out front.

"Get your money back at the Model Garage!" shouted Gus. The crowd turned as one and swarmed over Dittington. They soon had their dollars back and were looking to Gus for an explanation.

Gus spoke severely to Mr. Dittington. "Mister, you got just what you deserved. You're out to cheat the public. Most especially, you discourage people who

[*Continued on page 222*]

TODAY'S WESTERN PINE TREE FARMING GUARANTEES LUMBER TOMORROW

Space-saving bunks are easy to build—economical, too!

You'll enjoy making these sturdy bunk beds of clean-cutting, even-grained Western Pine* woods. They'll take years of hard wear and keep their good looks indefinitely, thanks to the handsome natural texture and grain of these mellow woods.

Easy workability and amazingly low cost are *plus* values you get when you use carefully selected, well-seasoned Western Pines. See them at your local lumber dealer's and get an estimate.

FREE "INSTALLING AND COLORING YOUR WALLS OF WESTERN PINES." Also, "FRIENDLY HOME IDEAS IN WESTERN PINE," new 88-photo booklet of building and remodeling ideas. Write for both to Western Pine Association, Dept. 500-L, Yeon Building, Portland 4, Oregon.

the Western Pines

*IDAHO WHITE PINE
*PONDEROSA PINE
*SUGAR PINE

HOLD-E-ZEE®

the *Original* AUTOMATIC GRIP
SCREWDRIVERS

FINEST MATERIALS AND WORKMANSHIP

LOK-BLOK® makes blade twist and impact proof.
GRIPPER recedes deep into handle, giving full blade use.
SPECIAL BIT fits both types cross-point screws.

—YET COST NO MORE THAN ORDINARY SCREWDRIVERS!

At Leading Dealers Everywhere

UPSON BROS., INC., ROCHESTER 14, N. Y.

Use on furniture, floors, trim, exteriors

Softens up paint, enamel, varnish, etc. so it comes off in one easy scraping. Adheres to upright surfaces. At paint and hardware stores.

• ***Write for leaflet and advice on removing.***

Wilson-Imperial Co., 121 Chestnut St., Newark 5, N. J.

WORN ENGINE BURNING OIL!

Reduces oil bills!
Restores compression!
Increases miles per gallon!

Forms self-lubricating seal at piston top. Inserted through spark plug holes. Used by millions of motorists. Tested and approved by motoring experts.

$4.95 Tube for most cars

*PISTON SEAL

Write for Full DETAILS

See Your Neighborhood Auto Accessory and Parts Replacement Store

TREGLOWN CO. INC., FANWOOD 83, N.J.

*TRADE MARK REGD. CANADA: 1366 Greene Ave., Montreal 6 (prices higher)

Holt's HAVE THE ANSWER!

REPAIR MUFFLER AND EXHAUST LEAKS in 10 min.

The plastic gas-tight seal sets hard, withstands heat and vibration. Prevents carbon monoxide gas poisoning.

$1.69 per can

SETS LIKE A WELD—NO TOOLS NEEDED

Holt's GUN-GUM

*MUFFLER PLASTIC SEAL

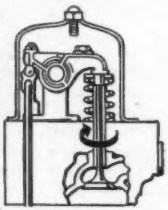
Care and Feeding of Engines

BY S. P CORP

VALVE TAPPET ROTATION

Valve tappets should rotate on the cam lobes. This rotation is caused by a small degree of rake on the surface of the cam lobe of the camshaft, coming in contact with a convex surface on the tappet foot and moving it part of a turn each time the tappet is lifted. This insures long life for tappets.

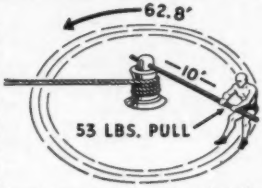
This rotation should be verified whenever valves are inspected. Failure to rotate means tappet may be dry in the guide, or a flat spot may be worn in the foot of the tappet. Check rotation when installing a new tappet or a new camshaft. If either tappet or cam lobe is worn, tappet may not rotate, causing wear and noise.



In L-head engines, tappet rotation promotes valve rotation, insuring a tight seal. In OHV engines it is important that valves rotate each time they open or close, to keep valve seat clean and minimize wear. If valves are not turning, look for a sticking condition in valve guides and check for correct valve adjustment. Lubricate valves around guides with penetrating oil.

TORQUE AND HORSEPOWER

Torque is twisting effort. If a man applied 53 pounds of torque on a 10-foot lever, moving over a 62.8-foot circumference in one minute, he would perform one-tenth of a horsepower of work. If he increased his speed to make two revolutions a minute, he would exert twice as much horsepower, but the 53 pounds of torque would remain the same. When an engine has 218 foot-pounds of torque at 2000 R.P.M., that is simply a statement of pull at the end of shaft (or lever).



WRITE FOR FREE MANUAL

Your name and address on a postal card will bring you this valuable illustrated manual of car care. It's full of detailed instructions, indexed by subject. When you re-ring, use SEALED POWER KromeX Ring Sets for longest ring life, easiest starting, and maximum oil control. KromeX Ring Sets break in fast! Your dealer has them or can get them for you. Sealed Power, Dept. H-6, Muskegon, Mich.

Sealed Power

PISTON RINGS

Gus Baits a Trap

[*Continued from page 220*]

would like to do things themselves. It takes more than a book of directions—especially yours. Now, do you want me to fix your car, or don't you?"

Dittington cleared his throat. "How much?" he croaked.

"Not a cent. But while I'm working, you stay in your car. This lesson in Do-It-Yourself is for these gentlemen only." He lifted the hood of Dittington's car and removed the breaker arm from the distributor. He took it to the back of his shop, out of hearing of the deflated little promoter.

"NORMALLY this sort of thing doesn't happen," Gus explained. "But this particular year on this car always gave trouble. Usually the breaker arm fits easily over the pin—not too loose, not too snug. But on this car, a new set of points always has a tendency to be too tight. Being too tight, the friction of its movement on the pin causes heat. The heat causes it to bind. It almost always happens *just about a half-mile away,* if you put in new points as you got them. I'll take this reamer and make this hole a little bigger. Now it will run free."

"What I don't understand," said Jack Bishop, "is why this never happened to Dittington before."

"He just bought this car a short while ago," Gus explained. "Hadn't had this make before. The ones he'd had didn't have this trouble. Now let's speed the little faker on his way."

In a jiffy the job was done, the hood lowered and engine purring. Philo Dittington leaned out the window.

"Sir," he said, his weak eyes moist, "I owe you a debt of gratitude."

As he drove out of sight, Stan Hicks, Gus's helper, murmured, "Boy that was close, Gus. Suppose that car had gone more or less than a half-mile? Or that he had taken a different road out of town?"

Gus smiled. "That's easy. We would have gone into the book business." END

NEXT MONTH: Gus follows a false trail.

BE PRECISE

Say STANLEY

It's A *Good* Rule

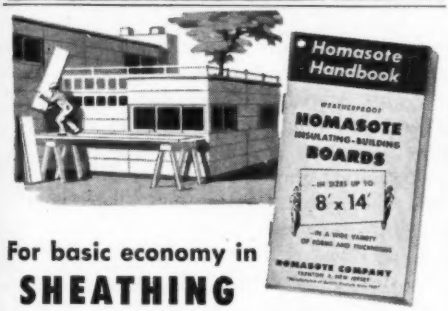
FREE MAGNA VIEW BOX

Easy to use 8′ tape rule–Model 1208W $1.19 at your hardware store.

Other Stanley Rules from 75¢ up, 6 ft. to 12 ft., and each in the reuseable plastic box with the magnifying lens. You'll use the rule — you'll use the box.

Write Stanley Tools, 2506 Elm St., New Britain, Conn., for *free* booklet on measuring tools and how to use them.

STANLEY



For basic economy in SHEATHING

Eliminate a dozen costly details in sheathing—*with better end results*—this is Homasote economy. Homasote insulates, sheathes and weatherproofs your house—all with only one material. *Homasote is different.*

The famous Homasote One-Man Sheathing is easy-to-handle, clean-to-handle — asphalt-free and in sturdy, V-grooved 2′x8′ panels. As pictured above, one man sheathes a building with Homasote quickly and easily — and with assurance that the job is done right, because the Homasote Handbook gives the know-how.

The Homasote Handbook describes another sheathing value — Big Sheets in sizes up to 8′ x 14′. Big Sheets need no corner bracing and save on nailing. Sheathing is only one of many subjects in this new 64-page Handbook—backed by 46 years' experience in the making of quality products. Use the coupon to secure your copy—plus three fully-illustrated folders suggesting 18 interesting and practical make-it-at-home projects, including furniture.

MAKE IT AT HOME—WITH HOMASOTE

HOMASOTE COMPANY
Department F-3, Trenton 3, N. J.

☐ I enclose 10¢ for Homasote Handbook.
☐ I enclose 10¢ for 3 Make-It-At-Home Folders.

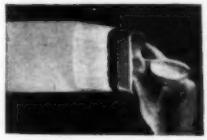
Name.....
Address.....
City.....Zone....State.....

How to choose a paintbrush that does faster, streak-free work

Here's why it pays you to use a brush with Du Pont TYNEX nylon bristles

1. No break-in! You don't have to soak or flex a new brush . . . if it has "Tynex" nylon bristles.

2. Full paint pickup! Specially tipped and flagged "Tynex" bristles hold a full load of paint.



3. Smooth, even flow! Anyone can do streak-free work, because each tapered "Tynex" bristle provides better, more even flow.

4. Easier to clean! They're the easiest-to-clean bristles there are! Paint loosens quickly in any commercial cleaner, rinses out thoroughly.

FREE! 8-page booklet full of helpful painting tips. Write Du Pont Company, Polychemicals Dept. PS-6 Wilmington 98, Del.

DU PONT

"Tynex" is the registered trade-mark for Du Pont nylon bristles.

Which Weldwood® finishing Wizard can help you today?

It's a good idea to keep them *all* handy. You never know what finishing problem may develop in working with wood. As products of the world's largest plywood organization, these "wizards" are designed to give you expert results in many finishing tasks.

For protecting and bringing out the natural beauty of any wood —use SATINLAC®

Makes the most practical, beautiful and durable natural finish for hard or soft wood! So quick-drying you can apply 3 coats a day. SATINLAC is so easy to maintain!

For blond woodsy effects without a "painty" look—use WHITE FIRZITE®

Versatile! A two-fold boon: (1) *As an undercoater* for soft wood or plywood paint jobs, seals pores to help prevent grain raise and checking. (2) *As a finish*, produces a blond woodsy finish with no "painty" look. Great for pickled and wiped effects too!

For making fir plywood look like costlier woods—use CLEAR FIRZITE®

Magic action for plywood stain jobs! Tame wild grain with a starting coat of *Clear* Firzite—add colors in oil to achieve the rich look of oak, walnut, mahogany. Clear Firzite also helps prevent grain raise and face checking.

Ask your hardware, paint, or lumber dealer about these Weldwood Finishing Wizards... or mail coupon for FREE leaflets.

UNITED STATES PLYWOOD CORPORATION
Box 525 – New York 46, N.Y. PS6-6S
Send me leaflets on:
☐ Satinlac ☐ White Firzite ☐ Clear Firzite
NAME_____
ADDRESS_____
CITY_____ZONE____STATE____

Can We Steer Hurricanes Away?
[*Continued from page 88*]

that you inject into the cloud," says Dr. Langmuir. "You can see the infection spread."

The dry ice starts a chain reaction that releases a great deal of energy from the cloud. In a hurricane, this release of energy might shift the storm center to one side of the powerful air currents which give the storm its general direction. That would change the path of the hurricane—not much, but a little. A very small change could be terribly important.

Will it work? Dr. Langmuir says, "I think the chances are excellent that with increased knowledge something can be done. Right now we are in the position of a surgeon who has a knife but does not know yet where to cut."

A somewhat less hopeful attitude is taken by the official Advisory Committee on Weather Control, which includes some of the country's leading meteorologists. The Committee states:

"These experiments will prove interesting and probably of value but if means are devised to prevent or significantly modify hurricanes this will probably be something for the far future."

(The Advisory Committee is, however, more sanguine about other uses of cloud-seeding. It concludes that rainfall is definitely increased by seeding, and that the prevention of hailstorms is a "hopeful prospect.")

The Weather Bureau's Simpson, who will direct the actual hurricane-seeding tests this summer, is cautiously optimistic. He says:

"The possibilities, such as they are, for changing the path of a hurricane depend on techniques for taking the storm by the hand and leading it gently to one side—probably no more than a few tens of miles. Yet this often would be enough to make the difference between disaster and relatively minor damage.

"There is no reason to believe that we cannot find out how to make hurricanes behave." END

NEXT MONTH: "The Man Who Made Work Easier."

Which Weldwood® Wizard can help you today?

What are you making or mending? Do you know about Weldwood's new developments in adhesives? Do you know that you need special glues for special jobs? Do you keep on hand all 4 of these Weldwood Wizards, developed to make your jobs easier, quicker?

For wood-to-wood joints that never come loose—use

WELDWOOD *Plastic Resin* GLUE

Imagine—joints glued with this Wizard are stronger than the wood itself! And they grow even stronger with age! That's why it's America's most popular wood glue. Highly water-resistant, stain- and rot-proof. Easy-to-mix powder. 15c, 35c, 65c and larger sizes.

For weatherproof boat repairs—use

WELDWOOD WATERPROOF RESORCINOL GLUE

100% Waterproof! A "must" for any wood gluing exposed to climate, boiling or salt water, cold weather, mold, fungus, mild acids, alkalies, etc. Terrific for sporting goods, woodwork in damp basements, lawn furniture. ¼ pints, pints, quarts, gallons.

For in-a-hurry gluing of wood, paper, cloth, fabric—use

WELDWOOD PRESTO-SET® GLUE

Ready to use. Sets fast! Glues like magic! Presto-Set is the Weldwood-perfected white glue that bonds wood to wood, wood to cloth, cloth to paper, upholstery fabrics to wood, leather to leather, etc. Clean to work with – no sticky hands. 19c, 29c, 49c tubes; pint and quart jars.

For putting up plywood panels without nails—use

WELDWOOD CONTACT CEMENT

Revolutionary! Speedier, easier, new way to install plywood panels. No nails, no holes to fill and finish. Bonds instantly, permanently on contact. No clamps and presses – ideal for applying plastic laminates like Micarta to table tops, kitchen counters, etc. 1001 other uses for home, hobby, garage. 29c, 40c, 70c and larger sizes.

There's a special Weldwood Wizard for every gluing job. Ask your lumber, paint or hardware dealer... or mail coupon for FREE leaflets.

UNITED STATES PLYWOOD CORPORATION
Box 525 – New York 46, N. Y. PS6-6G

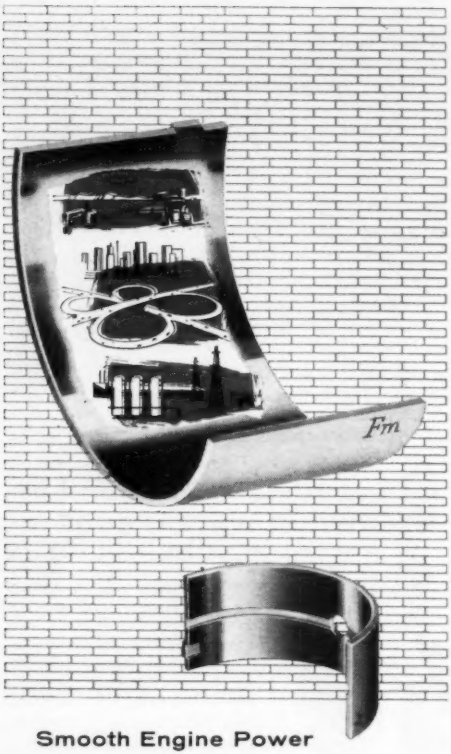
Send me leaflets on:

- ☐ Weldwood Plastic Resin Glue
- ☐ Weldwood Waterproof Resorcinol Glue
- ☐ Weldwood Presto-Set Glue
- ☐ Weldwood Contact Cement

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE____



Smooth Engine Power

calls for Quality Bearings . . .

FEDERAL-MOGUL QUALITY!

Federal-Mogul engine bearings are first choice for replacement in commercial vehicles and industrial engines. They are preferred by men who know their business . . . *and* their bearings! In your car engine, too, Federal-Mogul bearings restore smooth power, lively pick-up and economical operation. They are *engineered* for dependable performance!

FEDERAL-MOGUL SERVICE

Federal-Mogul-Bower Bearings, Inc.

Ask your Mechanic!

RESEARCH • DESIGN • METALLURGY
PRECISION MANUFACTURING • SERVICE

Keeping You Out of That Traffic Jam

[*Continued from page 116*]

I cut you off the last time. Here's a green light for you now."

This type of signal is replacing the fixed-time signal in many communities. The fixed-time signal rigidly allots a given number of seconds to each street, regardless of whether one or a dozen cars are waiting.

Combine a lot of traffic-responsive signals, under a master control, along a main street, and you have a sophisticated arterial system. Install them on main streets and cross streets, again under a master control, in a big area, and you have a "grid" system with a college diploma.

Such coordinated signal systems, as they are called, have been put in service in the last couple of years in—among other cities—Houston, Baltimore, Atlanta, Fort Wayne, Winston-Salem, Los Angeles, Vallejo (Calif.), New Orleans, San Diego, Mobile and Chattanooga.

The most extensive, and perhaps most complex, "thinking" traffic-control system recently was put into operation on Philadelphia's famous Broad Street, a madhouse of congestion at the morning and evening rush hours.

Single intersections report the number of cars on Broad Street and cross streets to a "brain." The "brain" collects the information and evolves a pattern of green-and-red timing for *all* the signals in its area. Moreover, it takes care that the *progression* of signals will not be upset. This gives a Broad Street motorist a succession of green lights at a particular speed.

Four master controls, in charge of four sections, boss Broad Street's traffic. In addition, there are three "floating" traffic light intersections where cross traffic is particularly dense. They are not dovetailed into the sub-systems.

The immediate gimmick in the car-counting circuit is a pressure pad sunk into the pavement. Pressure pads are installed all along Broad, as well as in each side street. When a car depresses a pad

[*Continued on page 228*]

Shop by Mail and Save! SURPLUS & NEW MANUFACTURE EQUIPMENT FOR HOME, FARM AND FACTORY

BRAND NEW 1 H.P.

12 Volt Electric Motor

ITEM NO. 308

- For electric wheel chairs (Pop. Mech. design—Mar.-'58).
- For electric golf carts.
- For self-propelled scooters, children's midget cars.

Rated 1 H.P.—100 amps., 5600 R.P.M.. If volts, D.C.—This double shaft motor of ball-bearing construction may be run on 6 volts for lower power requirements.—Standard ⅝" shafts, flange mountings – Dimensions: 9"x4½"x4½". Ship. wt. 19 lbs. A real value at..... **12.50** F.O.B. Chicago

GROBAN HYDRAULIC SPEED REDUCER with FINGERTIP CONTROL

ITEM #115

FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Cream Separators • Garden Tractors • Pumps.

Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Use input power of ¼ to 1½ H.P. Shafts ⅝" diam. Input rotation counter-clockwise facing shaft. Input speed 750 R.P.M. 7½" x 7½" x 11½". Output rotation reversible. Shpg. wt. 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago. **54.50**

MULTI-PURPOSE

HYDRAULIC PUMP OR MOTOR

ITEM #55

Silent, high efficiency, Helical Gear Type Ball Bearing, Hydraulic Pump or Motor. Rated 8 Gal. Per Min. At 1500 R.P.M.—delivers 1000 P.S.I. Using ⅙ H.P.—Reversible Rotation—¾" Pipe Thread Inlet and Outlet Ports —¼" Drain Port—¾" shaft with keyway and flat for either direct or pulley drive. Dimensions—5⅜" high, 7½" long, 5⅛" wide. Shipping weight 18 lbs. F.O.B. Chicago **45.50**

BRAND NEW 1956!
FACTORY-TO-YOU-VALUE

PORTABLE ELECTRIC LIGHT PLANTS

ITEM No. 1008-B

Dimensions:
Length 20½"
Width 12"
Height 16"

POWER TO OPERATE:
• Water pump, Radio, Lights, Air-conditioner • Refrigerator, Deep Freezer, Incubator • Electric Saw, Electric Drills, Pipe Bender

Compact—Fits in the Trunk of Your Car

FULL 1000 WATTS continuous duty. 115 Volts. A.C. 60 cycles. 9 amps. Powered by husky Briggs-Stratton engine with recoil starter. Engine and generator operate at 3600 R.P.M. for maximum efficiency at minimum weight. Both units are mounted on steel base, with heavy sheet metal belt guard. Generator is self-regulating, and is equipped with outlet box containing fuse and 2 A.C. convenience receptacles. Cost only 5c an hour to operate. Shipping wt. 100 lbs. (Regular price $225). You save $65.50. Now only. F.O.B. Chicago **159.50**

ITEM #2008 2000 WATTS 115 V. A.C. generator set, powered by husky, fast starting Briggs-Stratton engine. Mounted on portable steel carrying base for easy handling.—Just right for small cottage and cabins needing inexpensive 2000 Watts of electricity. Ship. Wt. 190 lbs. F.O.B. Chicago **295.00**

MASTER & SLAVE HYDRAULIC REMOTE CONTROL SET

Item #415—Designed for remote operation of controls on engines, boats, special machinery, etc. Eliminates complicated mechanical linkages, cables, pulleys, etc. The master unit connects to the slave unit with a single ¼" tube.

When master control lever is moved, slave lever follows exactly. Light, compact, aluminum alloy construction.

Dim. of both units: 5¼ W, 9" H, 1¾" D. (exclusive of handle) Ship. Wt. 8 lbs. F.O.B. Chicago.. **27.50** per pair

(Note—tubing not supplied)

HIGGINS BRONZE CENTRIFUGAL PUMP

PUMPS ALMOST ANYTHING

ITEM #414

Dimensions 12"x7"x8"

Fine for:— • Irrigation • Sump Pumping • Sewer Drainage

75 gallons per minute @ 2400 R.P.M.

Higgins Type PNB, Model R, marine bilge pump. Open Impeller design for handling muddy water. Delivers 75 gallons per minute. 30 foot head with ¾ H.P. motor. Pump body and impeller are made of solid bronze, with alloy steel ½" diameter shaft, 1¾" long. Rotation of the pump is clockwise. Inlet has 1½" pipe thread. Plain 1½" outlet for hose connection.

Shipping weight 23 lbs. F.O.B. Chicago..... **23.50**

ORDER DIRECT FROM AD. SATISFACTION GUARANTEED
Send Payment or Purchase Order Today
To place phone orders call WEbster 9-3793

GROBAN SUPPLY CO. Dept PS-6
1139 S. WABASH AVE., CHICAGO 5, ILL.

BELT DRIVEN

A. C. GENERATORS

ITEM #700

Ideal for powering electric tools, oil burner, refrigerator, lights, or other appliances requiring up to 700 watts of power. **700 WATTS**, 115 Volts, 60 cycles A.C. 3600 R.P.M. Compact, self-regulating generator with V Belt pulley and double outlet receptacle. Rotation counter-clockwise. May be driven by tractor or auxiliary gasoline engine. Requires 2 HP minimum. Dimensions: 10" long x 8" high x 6" wide. Shipping wt. 27 lbs. F.O.B. Chicago **59.50**

Model 1010, 1000 WATTS
Same as above. F.O.B. Chicago..... **79.50**
2000 Watt Generator **149.50**

SAVE $30.30 ON THIS PESCO

HYDRAULIC CONTROL VALVE

ITEM #371V

FOR SAFE POSITIVE CONTROL OF HYDRAULIC CYLINDERS AND MOTORS —• BUILT-IN RELIEF VALVE—factory set at 1200 P.S.I. • FOUR-WAY VALVE—to operate one double acting cylinder • OPEN CENTER —with valve in neutral, cylinder is locked in position and pump is unloaded. • SPRING RETURN TO NEUTRAL • FULLY BALANCED PLUNGER • EASILY STACKED INTO 2, 3, or 4 valve combinations for multiple cylinder operation. • 8 gal. per min. capacity, at 1500 P.S.I.—¾" pipe ports • CONNECT PUSH RODS TO HANDLE FOR REMOTE CONTROL • EASY MOUNTING. • LIST PRICE — $46.80. • YOU SAVE $30.30. • DIMENSIONS— 9"x4½"x2¼"—Ship. Wt. —8 lbs. F.O.B. Chicago.. **16.50**

HYDRAULIC

LIFT CYLINDERS

• For Fork Lift Trucks • For Presses • Loading Ramps • Lifts 12500 lbs.

Heavy duty hydraulic cylinders, at big savings.

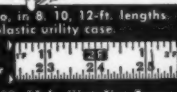
ITEM #502—4" Bore—36" Stroke—1¾" Piston Rod. Wt. 95 lbs. F.O.B. Chicago..... **72.00**
ITEM #503—4" Bore—54" Stroke—1¾" Piston Rod. Wt. 135 lbs. F.O.B. Chicago..... **96.00**

FREE! — NEW CATALOG
1956 EDITION, 56 PAGES,
chuck-full of unsurpassed War Surplus and newly manufactured Equipment Bargains for farm, home, factory. Workshop. Write letter today.

Insist on *Evans* TAPES
"THE MATHEMATICAL GENIUS"
AT YOUR HARDWARE STORE

6-ft. pocket tape only 98¢

Available, too, in 8, 10, 12-ft. lengths. Each with FREE plastic utility case. Automatically figures for you in feet and inches or total inches.



Also in 6, 8, 10, 12-ft. King-Size Tapes.
EVANS RULE CO., Elizabeth, N. J.

Make $5.00 an Hour

CASH PROFIT

The Day You Start!

Start Your Own Business at Home . . . Sharpen Household, Garden and Shop Tools in Spare Time

Turn your spare time into Big Cash Profits with the new Belsaw Sharp-All. No experience needed to sharpen knives, scissors, shears, ice skates, mower blades, hedge trimmers, axes, chisels and circular saws . . . just about any household, garden and shop tool. Your own CASH business. No inventory . . . no calls to make.

Learn how easily you can start your own spare time business. Amazing low cost easy-payment plan. Send postcard for

FREE BOOK

BELSAW SHARP-ALL CO., 706 Field Bldg., Kansas City 11, Mo.

Now! a full size economical
TURNER
Util-i-torch*
that has hundreds of uses!
only $4.99
*Propane gas

disposable cylinder

√ easy to operate
√ lights instantly down to — 30° below zero
√ no pumping
√ no priming
√ simple to use

Now you can do hundreds of jobs quickly and easily with the TURNER "Util-i-Torch." It's light weight, compact, long burning and extremely versatile. See, try and buy this big value at your neighborhood hardware store today.

And on all the other jobs for which you've wished you owned a blow torch.

THE TURNER BRASS WORKS
SYCAMORE, ILLINOIS

Keeping You Out of That Traffic Jam
[*Continued from page 226*]

in a side street, an intersection light controller—the "straw boss" of the system—takes note.

Two factors govern the length of time the car will wait for the light. One is the volume of Broad Street traffic. A count of this is maintained at each sub-system headquarters on the basis of reports by the Broad Street pads. The other factor is the "offset" of the Broad Street lights—the progression-timing at which they are turning green.

How *long* the side street gets the light depends on Broad Street traffic and how many cars have crossed the pad in the side street.

Helping, too, during rush hours on Broad Street is a system of "unbalanced flows"—an extra lane in the direction of densest travel.

Pedestrians are not forgotten. Push buttons at intersections along Broad Street enable them to get a light. They have 15½ seconds to cross.

Almost everywhere that traffic-actuated controls are in operation, traffic is moving at a faster clip. Houston and Los Angeles make especially strong affirmation that traffic jams can be unjammed. With one-way streets, traffic-actuated signals, wide expressways without intersections and unbalanced flows, traffic is being moved faster all the time.

Los Angeles, in particular, has amazed the experts. The goal of the traffic engineers is to move 1,800 cars an hour per lane past any given point. Most towns move a quarter to a half of that. But Los Angeles is moving up to 2,100 vehicles per lane at the rush hours on its freeway (expressway) system.

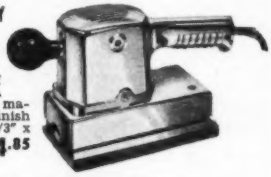
Constantly experimenting, the traffic engineers find that the jam problem frequently is cumulative. They installed traffic-responsive lights for 11 miles along Ventura Boulevard in Southern California's San Fernando Valley.

The lights worked fine, but Ventura Boulevard fed so much traffic into the Hollywood Freeway that traffic jams began developing *there*. END

TAKE THE WORK... Out of SPRING PAINTING With a DREMEL SANDER!

Easy does it—when you use a DREMEL *Straight-Line Action* SANDER for all your spring refinishing projects. Why sand by hand when it's so much easier and faster with a Dremel. A welcome addition to any man's shop and a fine gift for Father's Day. Three popular models to choose from. DREMEL *Straight-Line Action* SANDERS sand with-the-grain of the wood—leave no cross-grain scratches or swirl marks to spoil your finish.

IDEAL FATHER'S DAY GIFT



MODEL 53

The deluxe sander of the Dremel line. A powerful heavy-duty machine for rough and finish sanding. Pad size 3-2/3" x 7". Wt. 5¼ lbs. **$34.85**

MODEL 2000

This is the most popular, all-purpose sander in the field. Ideal for shop and home use. 14,400 strokes per minute. Pad size 3⅛" x 7". Wt. 2½ lbs. Model 2000 Sander Deluxe Kit with steel case **$24.50**

Model 2000 Sander only **$19.95**

MODEL B

A combination sander-polisher-massager for all-family use. Pad size 2⅜" x 5⅜". Wt. 2½ lbs..... **$14.85**

SEE YOUR DEALER for all 3 models. If he cannot supply you, order direct on 5 day trial, money back guarantee. Remit in full and we'll ship postpaid. Or send $2.00 now, pay postman balance plus postage and C.O.D. fee.

WRITE FOR FREE CATALOG

DREMEL MANUFACTURING CO., Dept. 126-F, Racine, Wisconsin

FREE NEW TOOL DATA

Get the latest information on new and improved precision tools. Send coupon for your FREE illustrated catalog and examine these new tools in detail. Before you buy, see LUFKIN'S complete selection.

BUY LUFKIN PRECISION TOOLS

At Your Hardware Or Tool Supply Store

SEND COUPON FOR FREE ILLUSTRATED CATALOG

MAIL TODAY 424

THE LUFKIN RULE COMPANY, DEPT. PS, SAGINAW, MICH.
Please send your free "New Tools" catalog to:

NAME_____

STREET_____

CITY_____ STATE_____

Herb Thomas
—ace driver of NASCAR (National Association for Stock Car Auto Racing), says:

"We give oil filters their toughest test

—and we pick Purolator for every make of car!"

Protect your car like the "pro's" do! Because a Purolator can trap up to 3 pounds of grit in one NASCAR race, 9 out of 10 drivers use Purolators *whichever make of car they drive!*

Purolator Micronic filters stop dirt fine as 39 millionths of an inch . . . have up to 10 times greater capacity than many oil filters.

Ask your serviceman to put in a Purolator refill every 4,000 miles—when he changes your oil. Takes only minutes. From $1.60.

© 1956, Purolator Products, Inc., Rahway, N. J.; Toronto, Canada.

"Purolator" and "Micronic," Reg. U. S. Pat. Off.

Proved best for every make of car

PurOlator

OIL FILTERS

NEW CHILDERS DO-IT-YOURSELF CARPORT

Patent Pending

The modern way to protect your car and beautify your home

"We installed ours in four hours . . . saved $95,"

says Mr. Joseph Saladino, Houston, Texas.

The Saladinos' problem was more living space. So—they installed a new Childers Do-It-Yourself Carport for the family car, and converted their garage into a third bedroom. **You save twice with the new Childers Carport.** First, you deal directly with your local Childers factory outlet. Second, it's so simple and easy to erect the Childers Carport yourself. You can erect it in one afternoon! The new Childers Carport is America's most modern design. Architecturally approved, its beautiful, trim lines harmonize with any style home. It increases the value of your property. Precision-made from zinc-plated steel, it will last as long as your home.

New, modern car protection • Save up to $95 • Erect in one afternoon • Full size, 20' x 10' • Pay nothing down • Only $1.93 a week • Free standing or attached

CHILDERS ALUMINUM AWNINGS GUARANTEED TO SAVE YOU 30%

Berkley

Windsor

Casement Awning

Door Canopy

We guarantee your cost of Childers Aluminum Awnings will be at least 30% less than your neighbor paid last year for his old fashioned, custom-made awnings. You save 30% or more because:

1. You get factory prices from your direct factory outlet.
2. You install Childers Aluminum Awnings yourself with just screw driver and pliers. Saves installation charges.
3. Childers Awnings are mass produced in the world's largest aluminum awning factory. Costly hand assembly is eliminated.

Your local Childers factory outlet can supply the correct size Childers Awning to fit any window, door or porch—at direct factory prices.

FREE IDEA FOLDER

CHILDERS GUARANTEED Products

Childers Manufacturing Co., Dept. PS-6
Houston 8, Texas

Send me free literature on the Childers guaranteed products checked below; also name of my local Childers factory outlet.

Childers Carport ☐ Childers Aluminum Awnings ☐
Childers Patio Cover ☐

Name_____

Address_____

City_____ Zone_____ State_____

Lumberyard Known 'Round the World

[*Continued from page 133*]

random customers just out of politeness.

It suddenly occurred to Albert Jr., that if he could scare up enough small purchasers the business might be revived. He invested $5 in an ad in a home workshop magazine. With another small ad in POPULAR SCIENCE MONTHLY, Constantine's home craftsman business was started on its way.

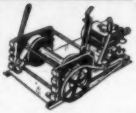
Strictly a family affair, the firm now includes, besides Mr. Constantine, a daughter who works in the office, and her husband, John Docherty, who is in charge of the mail-order department. Mrs. Constantine is the company's chief buyer. In Mr. Constantine's office are the first and second desks ever owned by the company—now valuable antiques—and an oil portrait of John Constantine, the firm's founder, in his uniform as a lieutenant in the War of 1812.

> ***You've got to admire the fellow who hits the nail squarely on the head for keeping his eye on his thumb.***
>
> —THE SIDEWALK SUPERINTENDENT

Besides the Constantine family there are about a dozen other employees during slack periods and 20 to 25 during the rush winter season. To help reduce the summer slump, when good weather keeps home craftsmen out of doors, the company has recently begun selling boat lumber and marine supplies.

The salesmen are craftsmen who speak the language of the experienced wood shopper. Mr. C has two workshops—one in his winter home on City Island, New York, and the other in his cabin in the mountains. John Docherty has taken courses in woodworking and power tools and made a lot of his own furniture. On Saturdays the company sponsors lectures at nine a.m. with repeat classes at two p.m. The most popular, which takes five weeks, is on wood finishing; others cover such subjects as power tools, wood joinery, plastic carving, veneering, making inlaid pictures and upholstering. END

Rugged, ball bearing WINCH



Sturdy ball bearing winch — super tough aluminum alloy construction. Powered by an easy starting 2¾ HP Briggs gas engine thru gear reduction drive:—it exerts up to 3000 lbs. of terrific force for hoisting materials or pulling. Combination gear and pulley reduction results in tremendous multiplication of engine power. Idler pulley clutch arrangement and built-in drum brake (with ratchet hand lever) enables operator to ease loads down gently and lock at any point desired. Drum handles 400 ft. of ⅜" cable or 600 ft. of ¼" cable. Ideal for contractors, farm implement trailers and unlimited other uses! (Item 795) Wt. 125 lbs. Only **$149.50**

HAND WINCH—Same winch with large crank handle for extra leverage and 2 speed drive. (Item 794) Wt. 60 lbs. **$59.50**

EXTENSION CORD

Heavy duty and very flexible. Neoprene 14-2 cable. 20 year quality. Wt. 12 lbs. (Item 185) 100 ft. Complete with rubber plug and outlet. A terrific buy at only **$8.95**

No. 10-2 POWER CABLE. Heavy duty, very flexible, rubber covered, 50 ft. with male and female fittings. Wt. 9 lbs. (Item 592a) **$10.45**
50 ft. without fittings (Item 592) . . . **$9.45**

NO. 12-2 POWER CABLE. Very flexible rubber covered, special outside shield for grounding power tools, etc. 50 ft. (Item 199) wt. 8 lbs. **$6.95**. 100 ft. (Item 200) **$12.95**

HI-FLO Centrifugal PUMP

Completely self-priming! No foot valve required. Tremendous capacity—100 gal. per min. ! . . Special impeller enables pump to handle muddy or sandy water. Simple to operate—simply start engine and watch the water go. Powered by a rugged, easy-starting 2 HP Briggs engine. Prelubricated sealed bearings for years of heavy low-cost service. Big 1½" Model. Item 502. Wt. 70 lbs. Factory price . . . **$134.50**

2" Model (150 gal. per min.) with 2½ HP engine. Item 502a. 90 lbs. Fact. Spec. **$154.50**

SAVE middleman profits... get MASTER MECHANIC'S bedrock factory prices

(Item 24)

600-700 WATTS PUSH BUTTON START

115 v. 60 cyc. AC Powered by a rugged 2 HP easy starting Briggs engine. No wiring necessary; just plug in and operate. Plenty of current for any oil burner, freezer, brooder, emergency lights, etc. which require up to 700 watts. Ideal for television and radios. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. (Item 24.) Wt. 75 lbs. Easily fits in car trunk. Be prepared if storm knocks out power lines. Reg. $275 value **$143.50**

1000-1200 Watt Plant (Item 45) same as Item 24 but larger generator and engine with 50% greater output. **$199.50**

We make every type and size of light plants—Write, giving us your requirements!

JET STEAM MASTER

Now, a super efficient portable steam generator that produces live steam at 100 lbs. pressure in 60 seconds from a cold start! Produces large volume of high pressure steam on 2 pints of fuel oil. Instantly cleans sticky grease, dirt, rust, old paint, etc. off implements and road machinery. Pays for itself in a few weeks. Sterilizes soil. Sterilizes as it cleans—milk equipment, etc. Fully automatic—oil fired with new, built-in lifetime bronze water circulating pump. Draws water from faucet or bucket. Simple and safe—anyone can use it; built-in safety valve. Complete with 12 ft. of hi-pressure steam hose and new triple efficiency steam gun that automatically mixes in soap solution if desired. Wt. 250 lbs. Item 463. Special factory price. **$329.50**

RUBBER HOSE

Genuine Neoprene Hose — outlasts ordinary rubber 3 to 1. Reinforced with super tough cotton cord piles—yet completely flexible. Equipped with standard thread male and female fittings. Pump water for irrigation, stock tanks, home, barn, fire fighting, etc.—or pump gas and fuel oil. Volume factory prices—save more than 60%.

TERRIFIC VALUES!

Inside Dia.	Length	Price
1"	10 ft.	5.95
1¼"	10 ft.	8.95
1¼"	25 ft.	13.95
1¼"	50 ft.	24.75
1½"	100 ft.	49.95
1½"	10 ft.	10.95
1½"	25 ft.	14.75
2"	10 ft.	16.50
2" (no cord plys)	10 ft.	9.50
2" (suction)	14 ft.	21.50
2½" (discharge)	10 ft.	21.75
3"	10 ft.	25.50

½" I.D. HIGH PRESSURE **STEAM HOSE** per ft. **$1.00**

AIR HOSE Heavy duty, ¼" I. D., 2 plies (150 lb. pressure) with standard couplings, 20 ft. lengths, ea. **$2.95**

PAINT SPRAY MATERIAL HOSE ⅜" I. D. Synthetic Thiokol innertube and neoprene cover—finest made! 25 ft. lengths with standard couplings. (Item 62) each **$7.50**

HEAVY DUTY D-C ARC WELDER

with mounting flanges (Item 38)

Use as portable or shop welder. Up to 300 amps. Senior model. Made for years of trouble-free continuous service. Will handle light or heavy jobs. Easily welds up to ¾" plate using ¼" rods. Built-in air cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hi-lo switch and dial control gives wide range of welding heats. Run welder at 2600 rpm. with tractor, jeep or 15 hp. gas engine, or 7 hp. elec. motor. Complete with instructions, guar. and triple V belt or flat pulley. Easy to hook up and easy to operate. Wt. 110 lbs. $400 value **$119.50**

WELDING KIT two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at . . **$10.50**

Send check or M.O. Prices f.o.b. Factory. 10 day Money back guarantee. SEND 10c for . . . BIG 1956 Catalog

MASTER MECHANIC MFG. CO., DEPT. 68-M **Burlington, Wis.**

Window or Attic FANS at amazingly SAVE up to 75% WITH FAMOUS FAN KITS

ANYONE CAN DO IT!

LOW COST!

No special tools or skill required. Absolute MONEY-BACK GUARANTEE. Only a few pieces of lumber and new or used ¼ HP 1750 RPM motor required to complete. Thousands in use.

DEALER INQUIRIES INVITED. Write for special money-making offer!

COMPLETE KIT includes: Aluminum fan spider, masonite blades, Shaft, Oilite bronze bearings, collars, pulleys, belt and bolts. Step-by-step instructions sent you make assembling fast and easy for standard or horizontal installations.

30" Fan cools average home, 6,000 CFM	$14.95
36" Fan cools larger home, 8,000 CFM	17.95
24" Fan cools smaller homes, 4,500 CFM	13.95
20" Fan cools apt., offices, etc., 2,800 CFM	12.95

Money order or check with order shipped postpaid, $3.00 deposit on C.O.D. orders. Circular free.

FAN KIT COMPANY
154-K NO. BELVEDERE • MEMPHIS, TENN.

MAKE QUICK, ACCURATE MEASUREMENTS OF SMALL DIMENSIONS

$21.00 INCLUDES CASE AND 1 SCALE

Measuring Magnifier • Measure radii, angles, diameters, decimal inches and decimal millimeters with ease and accuracy. Wide, flat field free from distortion with precision 7-power lens. Choice of general purpose and 3 separate scales. Protective carrying case fits pocket. Write for free catalog illustrating full line of B&L magnifiers.

BAUSCH & LOMB

Bausch & Lomb Optical Co., 55306 Bausch St., Rochester 2, N. Y.

Daredevils Challenge Ghost Ship

[Continued from page 110]

tows—after that he just quit counting.

Below Vicksburg, his two Mark 40 Mercury motors were purring like contented cats when he suddenly found the river aflood with driftwood. A logging camp on the Yazoo had chosen this time to discharge a sea of refuse into the Mississippi. Before he could say "Koenig Cup," Sawyer's boat was dead in the water, surrounded by logs and a floating mat of tangled wild grapevine.

Wearing his life protector—standard equipment for Mississippi racing pilots—Sawyer jumped into the water with a hacksaw. One by one, he sawed through the grapevine tendrils that had wound around the props, replaced a sheared pin, and got under way.

Later he lost 3½ hours with engine trouble. As he neared St. Louis, he ran afoul of a fisherman's trotline. It took him two hours to clear his props, but he still managed to beat the record and hold the Koenig Cup for a year.

River racing is not cheap. Sawyer's boat, a 15-foot hull of molded plywood with fiber-glass covering, which he calls the *Huckleberry Finn*, was specially made—the reinforcing has to be heavier than in an ordinary boat—and cost $800. His twin motors cost $1,300. He paid $500 to five friends who followed him upriver in a station wagon and a truck, contacting him at eight refueling points. By the time he got through he had probably spent close to $3,000.

But for somebody trying to chase the ghost of the *Robert E. Lee* up the broad Mississippi River, outlays like this come under the heading of normal expense.

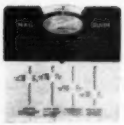
This July or August, a sunburned Lee Sawyer will probably be out there again, with a two-day beard, bloodshot eyes and a haggard look, trying to make in 40 hours by boat a trip he could make by car in 14. And chances are there will be some other river rats furiously pounding upstream in his wake. END

shorter swing

surer drive

Can't Break!

Estwing Tools



Nail Guide — 10c

Handy calculator tells right nail and hammer to use . . . number of nails to a pound. Send 10c to cover handling.

The Mark of the Skilled

1 Head can't fly off.
2 Handle can't loosen, break or splinter.
3 Forged in one piece of fine tool steel.
4 Cushioned leather grip can't loosen or come off. Gasoline, oil, or perspiration won't affect it. Lasts for the life of the head.

ESTWING MFG. CO., ROCKFORD, ILL.
WRITE DEPT. PS-6 TODAY

A COMPLETE LINE OF HAND TOOLS FOR CRAFTSMEN AND OUTDOORSMEN • AT HARDWARE STORES

U.S. ARMY FIELD PHONE

A private phone or intercom system. Ideal for use on target range, farms, mountains, forest or any place where portable two-way communication is desired. This is the famous EE-8 field phone used to success by the Signal Corps. Gives clear reception up to 15 miles. Uses two standard batteries. Set consists of a ringing generator, one phone, all contained in the original handy carrying case. Several of these phones can be used on one line. Recond. checked out. Price per ea. phone. **17.50**

Price for a SYSTEM – two sets . . **32.50**

133 PIECE POWER TOOL ACCESSORY SET – 1.98

The complete accessory set for any small job. Can be used with any electric drill or grinder. Contains 133 pieces including grind, polish, cut-off & buffing wheels, sanding discs, steel cutters, mandrels, burnisher, mounted stones and knife edge rubber wheels.

NEW 4-SPEED HOBBY MOTOR

Has four take-off shafts turning at 5, 25, 150 & 4000 RPM. Operates on 110 volt, 60 cycle current. Ideal for home shop, barbeque. **8.95**

REMODEL YOUR FURNITURE

FOAM RUBBER – Write TODAY FREE Catalog of our complete line. . .

VICKERS BRASS 4-WAY VALVE

Will stand 2500 PSI. A heavy-duty valve with an ALL Brass body. Closed center, off in neutral. Ideal for use with any liquid. A $200.00 Value . . **37.50**

VICKERS HYDRAULIC TRANSMISSION

Self-contained, constant torque at all speeds with variable volume, reversible piston pump which supplies piston hydraulic motor. Has 2 H.P. Automatic pressure dash pot for smooth control. Power output RPM –0 to 1/3 input RPM in both directions. Input RPM 1800 continuous, 4000 intermittent. Ideal for Lathes, Duplicator setup on Mills, Conveyors, Small Cars, Drives, etc. **49.50**

4" SPLINE SHAFTS for input and power take-off on above. Pair $2.50

INPUT & TAKE-OFF PLATE ASSEM. To adapt Trans. to pulley drive. Has 1/2" keyway shafts, spline shafts and High Speed bearings. New per set **20.00**

SURPLUS BARGAIN

No. 29 HYDRAULIC CYLINDER – Will give 20,000 pounds thrust using 1500 PSI line pressure as delivered from one of our hydraulic pumps. Gives up to 40,000 lbs. thrust with 3,000 PSI. Has a 4" bore and 18" stroke. Overall length 30½ inches.

Reconditioned and Checked **37.50**

SAVE 50% ON NEW PALLEY HYDRAULIC CYLINDERS

Send for Special HYDRAULIC CATALOG SUPPLEMENT – Shows entire line of new Hydraulic Equipment designed especially to fill the needs of Industry. Also SAVE up to 85% on War Surplus Hydraulic Equip. including Pumps, Valves, Fittings, etc.

NOW! A PROVEN FACT – SAFETY BELTS SAVE LIVES

NYLON AUTO SAFETY BELTS

MADE TO WITHSTAND A CRASH

LOAD OF 3000 POUNDS!!

Meets Civil Aeronautics Standards. Approved by Police, Safety Councils, Highway Patrol, Fleet Operators, etc.. Made of finest NYLON webbing and fitted with Aircraft type buckle. Easily installed in any car. Special sizes for Sports Cars. Available in the following colors: Blue, Green, Gray and Maroon. Don't wait! You May Be Sorry!

HOLDS YOU IN YOUR SEAT

PREVENTS THIS

9.95 VALUE — NEW — ONLY 4.89 EACH — SPECIFY COLOR AND ALTERNATE COLOR

3 SECONDS TO FASTEN – 1 SECOND TO UNFASTEN

SAVE 50% — FROM IMPORTER

PHILIPPINE MAHOGANY PLYWOOD AT PRICES LESS THAN WHOLESALE

For Paneling Dens, Offices, etc. Use in Cabinets, Furniture, etc. Rotary Cut. Both sides sanded. Bonded with finest resin adhesive. Face side unjointed. Shipped at lowest rates.

1/8" x 3 ft. x 6 ft. — 3.50 VAL. — MIN. ORDER 8 SHEETS — **1.79** SHEET

FREE SAMPLE ON REQUEST

1/4" x 4 ft. x 8 ft. — 9.50 VAL. — MIN. ORDER 4 SHEETS — **4.49** SHEET

SAVE 40% – TRANSLUCENT FIBERGLAS PANELS

Use it to cover patio, for interior decor, as walls, partitions and many other uses. Ideal for the Home or Office & in new construction. Finest quality, many widths and lengths. Variety of colors. FREE Sample and Booklet. An 85¢ per sq. foot value

ONLY 49¢ SQ. FT.

3400 RPM – ½ HP POWER SAW

RIPS – CROSSCUTS

CUTS A FINISHED 2x4 LIKE A KNIFE THROUGH BUTTER

COMPARES TO SAWS SELLING UP TO $49.50 — **19.98** — Complete with 5-1/2" Blade

A rugged, professional type, adjustable saw. Will cut any angle from 0 to 45°. Has an adjustable (0 to 6") rip fence. Safety-trigger switch on handle. Full ½ HP Universal AC-DC, 110-120 Volt, 60 cycle motor. Weighs only 6½ lbs. Thousands already sold. Your satisfaction guaranteed.

EXTRA SAW BLADES – Available in Rip, Crosscut or Combination. Please Specify price per each — ONLY 2.25 EA

SAVE UP TO 50% ON SPORT DIVING EQUIPMENT

BUILD YOUR OWN DIVING LUNG – SAVE up to $100. Our special folder contains complete instructions showing how it's done. Kit includes Air Bottles, Pressure Regulator, Hoses, Safety Belt, Shoulder Harness, Clamps, Mouth Piece, Valves, etc. . . . . .

Price for above kit . . **45.95**

With 2 Bottles (1 hour time)

$150.00 value

FREE DIVING CATALOG — Has latest info. on Diving Equipment. Plus an illustrated and described article on "How to build your own Diving Lung".

CORNELIUS AIR COMPRESSOR

A 3 stage, 1500 PSI air compressor. Has a built-in 1/3 HP., 27 volt, 20 Amp DC motor. Compressor will deliver .4 cubic feet of air per minute. Has a built-in safety valve. Can be adapted to fill underwater diving tanks, spray tanks, for inflating, etc. NOW **32.95**

GENERAL ELECTRIC AIR COMPRESSOR

A 2 stage AC or DC type compressor. Develops 1000 PSI. Has a 1/3 HP, 27 Volt, series wound motor. Ideal for spraying, inflating, painting, etc. **22.95**

PALLEY AIR TANKS

G-1 Type. Stainless Steel. Rust & shatterproof. Pressure tested up to 400 PSI. Has 1/4" pipe ports. 12" x 24" **12.95**

– UNDERWATER AIR TANKS – . ICC tested for 1800 PSI.

22 cu. ft. capacity. 5" dia., 19" long. **10.95**

38 cubic ft. cap. 7½" dia., 9" long. **14.95**

AIR HOSE

For use on underwater air mask. Top quality latex. Built-in non-return valves and mouth piece. All NEW !! . . . **6.95**

NEW AIR MATTRESS for ALL STATION WAGONS

CONVERT YOUR WAGON TO A FULL SIZE DOUBLE BED

A snug, comfortable, durable air mattress that makes a FULL SIZE Double BED! Made of heavy duty, laminated vinyl plastic with double welded seams. Extremely lightweight. Excellent for camping, sunbathing, etc. The safest way for the kiddies to ride. Available for Nash Rambler, Pontiac, Buick, Ford, Mercury, Plymouth, Chevrolet. Models 1952 – 1956. Specify. **23.95**

ARMY SKI TROOPER STEEL FRAME RUCKSACK

8.95 PLUS 10% FED TAX

Made of extra strong Army Duck. Has adjustable straps and bindings of heavy duty web with leather reinforcing at the strain points. One large main compartment and 3 small ones. Mounted on a special lightweight steel frame. A $12.95 VALUE

British Army Steel Frame PACK RACK – With fold-up pack shelf. Spec. design $5.95

CAMP ACCESSORIES

PORTABLE, FOLDING SHOVEL – With a 20 inch hardwood handle. Blade will fold to form a pick. Ideal for gardening or use in an emergency. **1.98**

MACHETE — 22" Vanadium Steel Blade with a 5" hardwood handle. Comes with rugged belt sheath. **1.98**

BOLO KNIFE — Top quality steel blade, 15" long. Comes with belt sheath. Ideal for clearing brush. **1.98**

ARMY PICMATOCK — Small, easy to use and pack. Has 12" steel head with pick on one side, mattock on other. 16½" hardwood handle. With case. ONLY **1.98**

NEW ARMY CANTEEN and REISSUE CUP and BELT — One quart aluminum canteen and cup fit into insulated canvas cover. Your choice of web pistol belt with grommets to hold extra gear or cartridge belt with extra pockets for items. . . **2.59**

WATERPROOF ARMY BEDROLL — Large 80" x 96" heavy duty duck canvas bedroll. Has roomy pockets in each end to hold extra gear. An ideal enclosed ground cloth for a sleeping bag or air mattress. Complete with (3) 8ft. web straps and buckles. A SURPLUS BUY! **5.95**

NAVY WADE SUITS

Covers the entire body from the neck down. Protects you from mud, water, etc. Originally designed for overboard work by the Navy. Made of heavy duty rubberized canvas with vulcanized seams. Has built-in rubber boots and gloves. Comes in sizes: Small, Medium & Large. $35.00 Value. **8.95**

AIR CORPS RUBBER BOATS

Ideal for Fishing or Hunting. Made to Gov't specs. Reconditioned and ready-to-use. Supply Limited.

1 MAN — Only **22.95**

6-7 MAN — NOW **69.50**

HAND AIR PUMP **3.95**

COLLAPSIBLE OARS **1.25** EACH

Write Today for FREE FOLDER No. CB on complete line of Camping Equipment.

Palley's 2263 EAST VERNON AVE. DEPT. PS-6 LOS ANGELES 58, CALIF.

Order From This Ad. Pay by M.O. or check. ½ deposit with C.O.D.'s. All Prices FOB Los Angeles Warehouse

Engine Has Four Pistons, One Cylinder

[Continued from page 104]

The Omega cuts this pounding to one-fifth that figure. This is because all pistons "float" between gas pressures. Every swing of each piston in both directions is a power stroke. And every power stroke is cushioned by a compression stroke. Friction losses, too, are considerably reduced in the cylinder, because there is no side thrust on the pistons from the connecting rods. Crankshaft whip is eliminated.

Bradshaw says that his Omega engine is the first four-cylinder machine to use two-cycle-type valves. One inlet and one exhaust port are cut in the side of the circular cylinder.

That means that poppet valves, with their springs, tappets, push rods and rockers have been discarded.

Only one spark plug, mounted on the cylinder periphery, is needed to fire the Omega. Timing is a pushover—just four breaker points (also on the cylinder), that brush past a fixed point.

Crankcase oil is maintained at an even temperature because it is completely separated from the hot engine. Air cooling is made easy by placing external fins on the split, aluminum cylinder casting. Rotating in an offset housing the cylinder acts like a centrifugal blower. In addition, a radial fan steps up the draft. It also extracts exhaust gases to reduce back pressure inside the cylinder.

The net result of all of these features is an engine capable of running at speeds of up to 12,000 revolutions a minute without damage to its parts.

Bradshaw, who has built four pioneer Omegas, is confident that any of them could roll up 200,000 miles before needing major overhaul.

U.S. engineers interested. One of America's "Big Three" motorcar producers is testing one of the pilot models. If there is a soft spot in the doughnut engine, the engineers expect it to show up in the curved pistons. This design prevents the rings from revolving, resulting in unequal wear. Also, there is a flat area on the inside of each piston, where the rocker arm is attached. A break in the curved contour might cause heat distortion and binding. END

These are days when the average man can get the world to beat a path to his door simply by purchasing a new power mower.

—THE SIDEWALK SUPERINTENDENT

NEXT MONTH . . .

The Joe Who Commands an Army of Scientists

DR JOSEPH KAPLAN, shown looking over a cutaway model of a rocket, is an important man in your future. As chairman of the U.S. committee for the International Geophysical Year, he commands an army of scientists who, a year from now, will launch the greatest assault ever made on the mysteries of the world we live in. Shooting satellites into space is only one of the feats they are planning. For a preview of others—and a close-up of Dr. Kaplan—see PSM for July.

MON 1 | TUE 2 | WED 3 | THU 4 | FRI 5 | SAT 6 | SUN 7

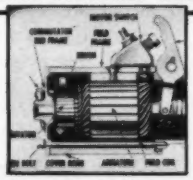
Yours Free.. Expert Advice on Car Repairs for a Whole Week!

Let this Personal Trial Prove to You This Is the Quickest, Easiest Way to

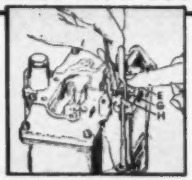
FIX ANY PART OF ANY CAR

USED BY U.S. ARMY NAVY MARINES

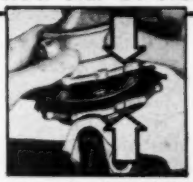
2900 PICTURES LIKE THESE SHOW YOU HOW STEP-BY-STEP



Step-by-step directions on how to fix starting motors, brakes, clutches, etc.



Illustrated repair procedures for all types of carburetors.



Pictures show how to take apart, fix all types of fuel pumps.

Whether You're a BEGINNER or an EXPERT, You'll Fix It FASTER and BETTER with this Famous Manual

JUST mail coupon below—without money—for a copy of MOTOR's famous AUTO REPAIR MANUAL. Use it *free* for a whole week. See for yourself how easily it helps you do any job on any car the very first time!

No guesswork! MOTOR's Manual takes nothing for granted. Tells you where to start. What tools to use. Then it leads you easily and quickly through the entire operation!

2,900 Pictures! So Complete So Simple, You CAN'T Go Wrong!

NEW, REVISED edition covers everything you need to know to repair any car. ONE THOUSAND giant pages, 2900 "This-Is-How" pictures lead you every step of the way. 291 "Quick-Check" charts—23,436 essential repair specifications. Over 225,000 service and repair facts on ALL 737 chassis models from 1946 thru 1956. Instructions and pictures so clear you can't go wrong! Even a green beginner can do a good job with this giant guide before him. You'll find yourself tackling jobs now that you wouldn't even touch before! And if you're a top mechanic, you'll be amazed by the time and labor-saving factory methods!

COVERS EVERY CAR FROM 1946 THRU 1956

The "Meat" of Over 160 Official Shop Manuals

The editors have put together the "know-how" from over 160 official Shop Manuals and hundreds of service bulletins and "boiled it down" into one fully-illustrated easy-to-understand guide.

Here's ILLUSTRATED step-by-step guidance you need to service and repair all car makes and models—all types of Engines. Special big section on Automatic Transmissions...PLUS valuable "Show-Me-How" chapters on Tune Up, Ignition Systems, Generators, Starting Motors, Starter Switches, Dash Gauges, Carburetors, Fuel Pumps, Brakes (Power and Hydraulic), Air Conditioning, Overdrives, Power Steering, Rear Axles, PLUS brand-new section on Trouble Shooting, and MUCH, MUCH MORE.

Try Book for a Week

Send no money. Pay nothing to postman. Test book in your own garage or shop. It's *GUARANTEED* to pay for itself in 7 days. If it doesn't, just return the book, and owe nothing. *MOTOR Book Dept., Desk 2F, 250 W. 55th St., New York 19, N. Y.*

Same FREE Offer on MOTOR'S New Truck Repair Manual

Brand new! Covers EVERY job on EVERY popular make gasoline and Diesel truck, made from 1946 thru 1955. FREE 7-Day Trial. Check proper box in coupon.

JUST 2 OF THE MANY LETTERS OF PRAISE

Amazed Self and Friends

"I amazed myself and my friends, too. Now do jobs that stumped me before." —Michael Balicsky, Newark, N. J.

A Help to Expert Mechanic

"Have been a mechanic for 25 years. MOTOR'S Manual still takes me out of tight spots." —V. Lauria, Nevada

Covers 737 Models—All These Makes

Buick	De Soto	Jeep	Plymouth
Cadillac	Dodge	Kaiser	Pontiac
Chevrolet	Ford	Lincoln	Rambler
Chrysler	Frazer	Mercury	Studebaker
Clipper	Henry J	Nash	Thunderbird
Continental	Hudson	Oldsmobile	Willys
Crosley	Imperial	Packard	

2,000,000 COPIES SOLD!

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MOTOR BOOK DEPT., Desk 2F, 250 W. 55th St., New York 19, N. Y.

Rush to me at once (check box opposite book you want):

☐ **MOTOR'S New AUTO REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, $2 monthly for 2 months and a final payment of 95c (plus 35c delivery charges) one month after that. Otherwise I will return the book postpaid in 7 days. *(Foreign price, remit $9 cash with order.)*

☐ **MOTOR'S New TRUCK REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. *(Foreign price, remit $10 cash with order.)*

Print Name.....Age.....

Print Address.....

City.....State.....

☐ **Check box and save** 35c shipping charge by enclosing WITH coupon entire payment of $6.95 for Auto Repair Manual (or $8 for Truck Repair Manual.) Same return-refund privilege.

RADIO'S ONE-WAY STREET

Dr. S. Weisbaum assembles an isolator which he developed for use in a new microwave system. Dr. Weisbaum is a Ph.D. in microwave spectroscopy from New York University. He is one of many young men at Bell Telephone Laboratories applying the insight of the physicist to develop new systems of communication.

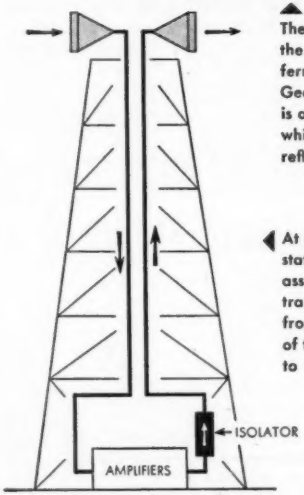
New radio relay systems for telephone and television now in the making will employ an ingenious device invented by Bell scientists. The device, known as an "isolator," senses which way microwaves are traveling in a waveguide, and stops those going the wrong way.

In the new systems a klystron wave generator sends signals through a waveguide to the antenna. The klystron must be shielded from waves reflected back along the waveguide by the antenna. The isolator stops reflections, yet allows the transmitted signals to go through clear and strong.

This isolator is a slab of ferrite which is mounted inside the waveguide, and is kept magnetized by a permanent magnet strapped to the outside. The magnetized ferrite pushes aside outgoing waves, while unwanted reflected waves are drawn into the ferrite and dissipated. This "field displacement" action results from the interplay between microwaves and a ferrite's spinning electrons.

This is another example of how Bell Telephone Laboratories research works to improve American telephony and telecommunications throughout the world.

The heart of the isolator is a ferrite slab. Geometric pattern is a carbon layer which dissipates reflected signals.

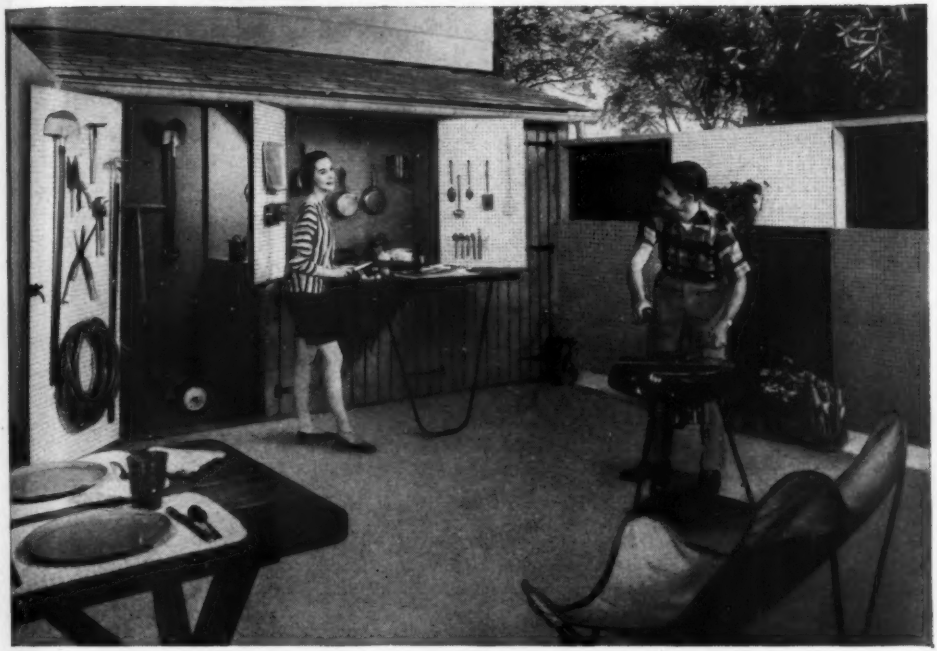


At a radio relay station an isolator assures one-way transmission from the output of the amplifier to the antenna.

BELL TELEPHONE LABORATORIES

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

Look for the man who makes the difference.



Build your own outdoor living room! Free plan from Masonite shows how!

You'll double the fun when you build this outdoor living center yourself. It's fun when you use Masonite Presdwood®—sturdy, weather-defying panels that are easy to saw, bevel, plane and sand. They go up quickly and take beautiful, long-lasting finishes.

You'll want Masonite Peg-Board* panels to keep cooking utensils neat and handy... to store garden tools without crowding... to build your "hanging garden" fence. You'll find the 4-foot width of Masonite Panel-groove quickly builds an attractive shed wall. See your lumber dealer for all Masonite hardboards. Send the coupon for a free, illustrated plan folder.

®Masonite Corporation
*"Peg-Board" T.M. Reg. U.S. Pat. Off. B. B. Butler Mfg. Co., Inc.

OPERATION HOME IMPROVEMENT

Fix it up with Presdwood inside and out

MASONITE
PRESDWOOD PRODUCTS

FREE PLANS!

Masonite® Corporation
Dept. PS-6, Box 777, Chicago 90, Ill.
In Canada: Masonite Corporation, Gatineau, Quebec

Please send me a free plan for the open-air living room and more information about Presdwood.

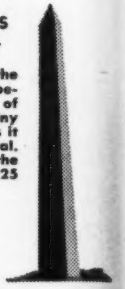
Name.....
Address.....
Town.....*Zone*.....
County.....*State*.....

It's here . . . It's new . . . It's different and 66% more powerful!

5 X 50 POWERHOUSE "GIANT"

Now magnifies area . . . 25 TIMES . . .

From this → to this →



These two dramatic photos of the Washington Monument prove beyond words the terrific power of this amazing binocular. The tiny photo is as the naked eye sees it miles from the nation's capital. The big picture is what the POWERHOUSE gives you—225 times the area!

Special now 4.98

Whatever your eye can see brought 5 times closer . . . from 1 to 25 miles away!

Reg. 12.95 Value!

Just arrived from Germany—the new **POWERHOUSE "GIANT"**. This model is new and completely different. It's 66% more powerful than the original **POWERHOUSE**. The finest ever developed by the famous 101 year old German factory. Gives you greater range, greater clarity, sharper images, and much more magnification. Bigger and better than ever before. German know-how and superb workmanship are reflected in the many quality features usually found in $25 binoculars.

Now 7 Ways Better:

1. High structural strength without tiring weight. It's only 12 ounces. **2.** Aluminum draw tubes for smoother faster focusing. **3.** Folds to your eye width. **4.** Precision Ground Lenses—**NOT PLASTIC!** That's why it doesn't give cloudy, blurred images. **5.** Objective lenses interior coated with magnesium fluoride, just like expensive cameras and $25 binoculars. **6.** Extra large 50mm. objective lenses gives you viewing even in moonlight! **7.** New 5X50 power system gives you 66% more power than original model. You get better viewing whether it's one or 50 miles away.

Buy direct from world's largest importer of German Binoculars

Thoresen has sold over 1,000,000 German binoculars in recent years. Because we are the world's largest importer of these glasses, we can buy for less and sell for less. That's why we can **NOW** offer you this 12.95 binocular for only **4.98.**

SEEING IS BELIEVING!

Try the Powerhouse Giant at our risk! ONE look thru this new **POWERHOUSE "GIANT"** will convince you! Because words and pictures alone cannot adequately describe it, we want to send one to you on 7 days home trial. Use it on hunting and fishing trips, the races, bird watching, boating and for vacation fun. Always have a "ringside" seat at sports events. Then, if you don't think this is the year's biggest binocular value, just return it for immediate refund of your 4.98. Order at once! This offer may be withdrawn due to production limitations in Germany. Send **4.98** check, m.o. or cash. In any case, you don't risk a cent. So rush coupon today.

THORESEN'S, Dept. 7-F-66
352 Fourth Ave., New York 10, N.Y.

RUSH COUPON FOR FREE TRIAL!

THORESEN'S, Dept. 7-F-66
352 Fourth Avenue, New York 10, N.Y.

RUSH ..... new model **POWERHOUSE "GIANT"** Binoculars at **4.98** each. I will enjoy it on full week's trial. I will test it for power, appearance, sharp viewing. If I am not thrilled in every way, I am under no obligation to keep it. I'll return it for quick refund of my 4.98. Include **AT NO EXTRA COST** Supply Grain Case & straps.

☐ Payment enclosed. **RUSH** prepaid.
☐ Send COD. I'll pay charges.

NAME.....

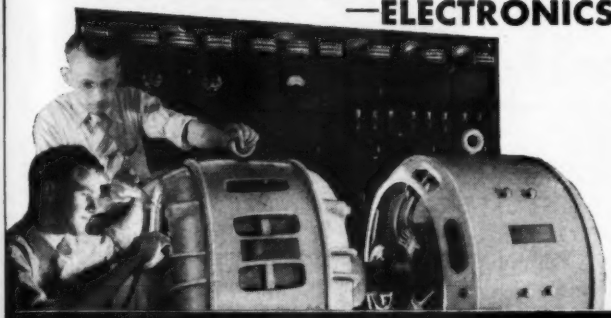
ADDRESS.....

TOWN.....ZONE....STATE.....

CANADIAN: Order direct from Thoresen Ltd., 45 St. James St. West, Dept. US-66, Montreal 1, P.Q. Same price, same guarantee. No extra for tariff.

THESE MEN ARE GETTING PRACTICAL TRAINING

IN ELECTRICITY —ELECTRONICS



On Real:

A.C. and D.C. MOTORS
GENERATORS
SWITCHBOARDS
CONTROLLERS
WIRING JOBS
APPLIANCES
ELECTRONIC UNITS

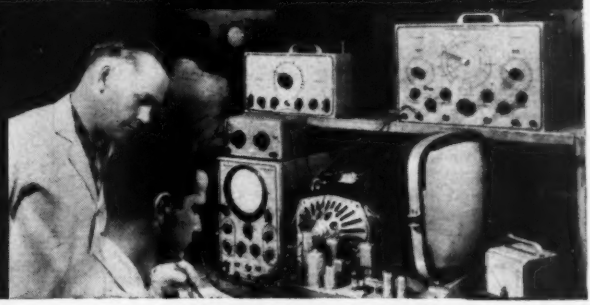
(Shown at left—Instructor explaining operation and testing of a large Motor Generator in our A.C. Department.)

AND TELEVISION-RADIO

On Real:

TELEVISION
RECEIVING SETS
Including Color TV
AM and FM RADIO
RECEIVERS including
AUTO RADIOS
TELEVISION TEST
EQUIPMENT

(Right — Instructor helping students check the wiring and trace circuits of television receivers.)



Train in the great SHOPS of COYNE

Largest, Oldest, Best Equipped School Of Its Kind In The U. S.

Whether 17 or up to 45 years of age, prepare for your future now. Don't be satisfied with a "No Future" job. Train the Coyne way for a better job *in a field that offers a world of opportunities in the years ahead.*

FINANCE PLAN Enroll now, pay most of tuition later. Part-time employment help for students.

WE TRAIN YOU IN CHICAGO on real equipment. Trained instructors show you how, then you do practical jobs yourself. No previous experience or advanced education needed.

CLIP COUPON NOW for big new illustrated Coyne book "Guide to Careers in ELECTRICITY and TELEVISION-RADIO". No obligation; *no salesman will call.* Get vital facts now! ***Training in Refrigeration and Electric Appliances can be Included.***

B. W. COOKE, Pres. **COYNE ELECTRICAL SCHOOL** FOUNDED 1899

A TECHNICAL TRADE INSTITUTE OPERATED NOT FOR PROFIT
500 S. PAULINA STREET, CHICAGO, Dept. A6-73H
ELECTRICITY ★ RADIO ★ TELEVISION ★ REFRIGERATION ★ ELECTRONICS

Mail Coupon for Big Free Book

Training Offered to VETERANS and NON-VETERANS Alike

B. W. COOKE, President
COYNE ELECTRICAL SCHOOL
500 S. Paulina St., Chicago 12, Ill. Dept. A6-73H

Send FREE **book** and details of all the training you offer. This does not obligate me and no salesman will call. I am especially interested in:

☐ ELECTRICITY-ELECTRONICS
☐ TELEVISION-RADIO

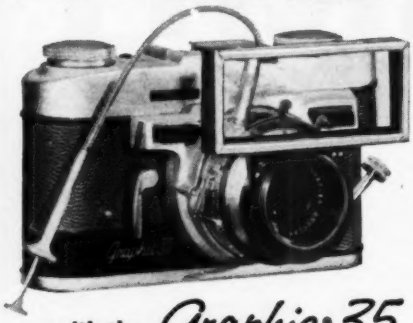
NAME.....

ADDRESS.....

CITY.....STATE.....

NOW...Push-Button Focusing

as close as 9" without parallax...



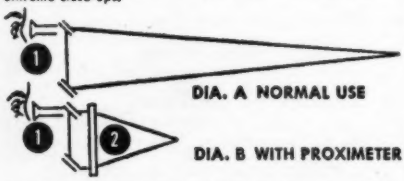
with the Graphic·35 and NEW PROXIMETERS!

Never before has close-up photography with the Graphic 35 been so easy and accurate. With these amazing auxiliary lenses on the camera, you can view your subject and focus it with the coupled rangefinder as close as 9"! The Graphic 35 itself focuses as close as 3 feet, but with the Proximeter I it focuses to 17½"; with the Proximeter II, to 12"; with the I and II in combination, to 9". (All distances figured from front of lens.)

CORRECTS FOR PARALLAX—You need not worry about parallax—(the variation between viewfinder field of view and what the lens records on your film). Proximeter lenses fit on the camera lens and automatically correct both viewfinder and rangefinder for the distance at which you are shooting. No measuring of distances. Proximeter plus exclusive Push-Button focusing do it for you. Minimum areas covered: Proximeter I, approx. 9" x 14"; Proximeter II, approx. 6" x 9"; I and II combined, approx. 4½" x 7". Diagrams below show how they work.

DIAGRAM A: Rangefinder (1) normally focuses upon subjects as close as 3 feet.

DIAGRAM B: Lens segment (2) in front of rangefinder bends light rays from subject, allowing rangefinder focusing for extreme close-ups.



Graphic 35 with f/3.5 lens: $77.50; with f/2.8 lens: $87.50; Proximeter I or II: $22.95. Pay only 10% down—take up to 20 months to pay! For Graphic 35 folder see your Graflex Dealer or write Dept. PS-66, Graflex, Inc., Rochester 8, N. Y.

GRAFLEX• *Prize-Winning Cameras*

Prices include federal tax where applicable and are subject to change without notice. Prices are slightly higher in Canada.

8" TILT ARBOR POWER SAW

NOW ONLY $19.95

SOLD DIRECT FROM FACTORY-TO-YOU!

Save big money. Buy direct from manufacturer. Big 8" power saw mitres, dadoes, cuts compound angles, crosscuts, rips, bevels. All cast iron and steel construction. Will last a lifetime; shipping weight 30 pounds. Uses any standard ¼ to ⅓ h.p. motor. Precision cast iron table. Blade tilts 0° to 50°. Single hand wheel controls depth 0" to 2-3/16".

INCLUDED: Famous Simonds 8" combination blade — at no extra cost. Buy direct and save. Send check, M.O. or write for FREE BOOKLET.

WRITE FOR FREE BOOKLET

AMERICAN MACHINE & TOOL CO.
ROYERSFORD 14, PA.

END TRANSMISSION FAILURES

CAUSED BY LUBRICANT LOSS

HERE'S GREAT NEWS FOR CHEVROLET AND FORD OWNERS! HERE, AT LAST, IS A WAY TO END LEAKY TRANSMISSIONS! The Davis Ball Boot seals both ends of the transmission coupling on Chevrolets; 1937 through 1954 . . . keeps dirt out, oil in, saves expensive metal parts.

For '55 and '56 Chevrolets, and Fords from '49 to '55, the Davis Ball Boot protects the factory seals against the intrusion of road grit . . . prevents failure of seals and bushings that result in lubricant loss.

Don't risk a burnt-out transmission. Don't put up with "temporary" repairs. ORDER A DAVIS BALL BOOT TODAY and END this trouble! Fits standard and automatic transmissions . . . easy to install . . . lasts for the life of your car . . . unconditionally guaranteed! (Pat. No. 2,702,996).

DAVIS BALL BOOT CO., INC., 2305 Yale St., Houston, Tex.
Rush postpaid the following Davis Ball Boot:

- ☐ For 1937-1954 Chevrolet @ $4.85 each.
- ☐ For 1955-1956 Chevrolet @ $1.45 each.
- ☐ For 1949-1956 Ford @ $1.45 each.
- ☐ Check ☐ Money Order Enclosed ☐ Send Literature

NAME_____
ADDRESS_____
CITY_____ STATE_____

DAVIS BALL BOOT CO., INC.
2305 YALE STREET, HOUSTON 8, TEXAS

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

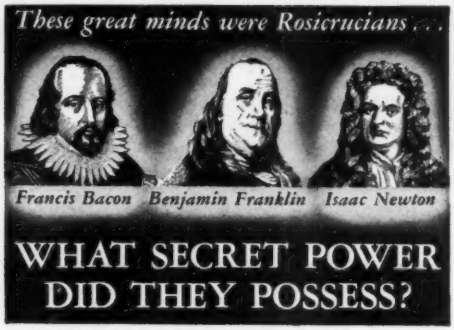
A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

62-F DISTRICT NATIONAL BUILDING

WASHINGTON 5, D. C.



Why were these men great?

How does anyone—man or woman—achieve greatness? Is it not by mastery of the powers within ourselves?

Know the mysterious world within you! Attune yourself to the wisdom of the ages! Grasp the inner power of your mind! Learn the secrets of a full and peaceful life!

Benjamin Franklin, statesman and inventor . . . Isaac Newton, discoverer of the Law of Gravitation . . . Francis Bacon, philosopher and scientist . . . like many other learned and great men and women . . . were Rosicrucians. The Rosicrucians (NOT a religious organization) have been in existence for centuries. Today, headquarters of the Rosicrucians send over seven million pieces of mail annually to all parts of the world. Address: Scribe T.O.T.

THIS BOOK FREE

The ROSICRUCIANS

San Jose (AMORC) California, U.S.A.

SEND THIS COUPON

Scribe T.O.T.
The ROSICRUCIANS
(AMORC)
San Jose, California, U.S.A.

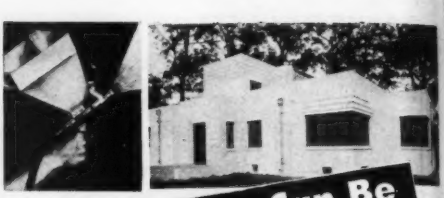
Please send me the *free* book, *The Mastery of Life,* which explains how I may learn to use my faculties and powers of mind.

Name_____

Address_____

City_____

State_____



C7

Colorcreting Can Be Your Big Opportunity

Local Colorcretors are Needed Everywhere

Colorcreting is a small investment enterprise, rich in sales potentials, high in income possibilities. Work is easy and fascinating. No experience required; we supply complete instructions.

Colorcreting is a building-beautifying process, with Colorcrete being pneumatically applied to new or old masonry surfaces such as concrete or stucco. Lasts indefinitely — 25 years or more. Easily cleaned. Gleaming white, or a choice of 30 colors.

Colorcrete equipment is compact and portable. Easy to operate and practically wear-proof. Easy-payment terms when desired. Write at once for Opportunity Book.

COLORCRETE Colorcrete Industries, Inc. 572 Ottawa Ave., Holland, Michigan

IN CANADA: DUNN MASONRY MACHINERY LIMITED 1022 Dundas Highway, Cooksville, Ont.

OWN a Business

If employed, start part time. Alert dealers can gross $5 hourly profit on own service plus $3 on EACH serviceman. Clean, revive, mothproof rugs & upholstery on location. No shop needed. Services nationally advertised. Repeat customers. Easy to learn. We locally train and assist you. Quickly established. Easy terms. Send today for FREE booklet. No obligation.

DURACLEAN CO., 6-186 Duraclean Bldg., Deerfield, Ill.

★ WORK FOR UNCLE SAM ★

U. S. GOV'T. JOBS! AS HIGH AS $4,525.00 YEAR TO START. Men, women, 18-55. Experience often unnecessary. Write immediately for FREE 36-PAGE BOOK with partial list of positions, salaries, sample tests, and full particulars telling how to qualify for them. (Not Gov't. Controlled)

Franklin Institute, Dept. S-90, Rochester 4, N. Y.

You can have a career instead of a job

Industrial growth . . . automation . . . technical advances create career opportunities for engineers, accountants, management experts. Share rewards awaiting college-trained men. Important firms visit campus regularly to employ Tri-State College graduates. Start any quarter in this world-famed college. *Approved for veterans.*

Bach. of Science degree in 27 months

in Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (TV-Electronics) Engineering. *In 36 Months a B.S. in Business Administration* (General Business, Accounting, Motor Transport Management majors). Capable students may accelerate. 36-weeks course in Drafting. *Intensive program; technical fundamentals stressed;* comprehensive courses with more professional class hours. *Small classes:* personalized instruction. For earnest, mature students whose time and budget requires accelerated courses and modest costs. Preparatory courses. *Beautiful campus* in friendly college town. Well-equipped, new and modernized buildings and laboratories. Enter June, Sept., Jan., March. *Write Jean McCarthy, Director of Admissions, for "Your Career in Engineering and Commerce."*

TRI-STATE COLLEGE

566 College Avenue. Angola, Indiana

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • COPYRIGHTS • PATENTS

142-W VICTOR BUILDING, WASHINGTON 1, D. C.

WHAT ALL AUTO MECHANICS WANT TO KNOW

1664 PAGES

This Big Practical Book gives full information with working diagrams covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.

Diesel Engines, Hydramatic & Fluid Drives Fully Explained.

A complete Guide of 1664 pages, with over 1500 illustrations showing inside views of working parts, with instructions for service jobs.

IT PAYS TO KNOW

How to fit pistons—How to locate engine knocks. How to fit connecting rod bearings—How to service main bearings—How to recondition valves—How to time valves—How to adjust fan belts—How to adjust carburetors and chokes. How to rebuild a clutch—How to service automatic transmissions—How to service brakes—How to adjust steering gear—How to cope with ignition troubles—How to service distributors—How to time ignition—How to "tune up" an engine.

$4 COMPLETE • PAY $1 A MO. TO GET THIS ASSISTANCE FOR YOURSELF SIMPLY FILL IN AND MAIL COUPON TODAY.

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a Handy Form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION. Send No Money. Nothing to pay postman.

MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me for FREE EXAMINATION books marked x below. If I decide to keep them I agree to mail $1 in 7 Days on each book or set ordered and further mail $1 monthly on each book or set until I have paid price, otherwise I will return them.

Check NOW!

You Can Look Over Any Guide In Your Own Home

—

Start the Easy Payments If Satisfied

MAIL THIS TODAY

- ☐ AUTOMOBILE MECHANICS GUIDE, 1664 Pages. $4
- ☐ TRUCK & TRACTOR GUIDE, 1299 Pages . . . 4
- ☐ DIESEL ENGINE MANUAL, 575 Pages 2
- ☐ MACHINISTS HANDY BOOK, 1650 Pages . . . 4
- ☐ WELDERS GUIDE, 400 Pages 1
- ☐ BLUE PRINT READING, 416 Pages 2
- ☐ MATHEMATICS & CALCULATIONS, 700 Pages. 2
- ☐ SHEET METAL PATTERN LAYOUTS, 1100 Pages 4
- ☐ SHEET METAL WORKERS HANDY BOOK, 388 Pgs. 1
- ☐ MECHANICAL DRAWING GUIDE, 160 Pages . . 1
- ☐ MECHANICAL DRAWING & DESIGN, 480 Pages 2
- ☐ AIRCRAFT WORKER, 240 Pages 1
- ☐ TELEVISION SERVICE MANUAL, 434 Pages . . 2
- ☐ RADIOMANS GUIDE, 1040 Pages 4
- ☐ ELECTRONIC DEVICES, 216 Pages 2
- ☐ ELECTRIC MOTOR GUIDE, 1000 Pages 4
- ☐ WIRING DIAGRAMS (Light & Power), 272 Pgs. 1
- ☐ ELECTRICIANS EXAMINATIONS, 250 Pages . . 1
- ☐ ELECTRIC POWER CALCULATIONS, 425 Pages. 2
- ☐ HANDY BOOK OF ELECTRICITY, 1440 Pages. . 4
- ☐ ELECTRIC DICTIONARY, 9000 Terms 2
- ☐ ELECTRIC LIBRARY, 7000 Pages (12 Book Set) 18
- ☐ SHIPFITTERS HANDY BOOK, 250 Pages . . . 1
- ☐ REFRIGERATION & Air Conditioning, 1280 Pgs. 4
- ☐ MILLWRIGHTS & MECHANICS GUIDE, 1200 Pgs. 4
- ☐ POWER PLANT ENGINEERS GUIDE, 1500 Pages 4
- ☐ ENGINEERS & FIREMANS EXAMS, 525 Pages . 1
- ☐ PUMPS, Hydraulics & Air Compressors, 1658 Pgs. 4
- ☐ OPERATING ENGINEERS LIBRARY (3 Books) . 9
- ☐ MECHANICAL DICTIONARY, 950 Pages 4
- ☐ GARDENERS & GROWERS GUIDES (4 Book Set) 6
- ☐ CARPENTERS & BUILDERS GUIDES (4 Book Set) 6
- ☐ PLUMBERS & Steamfitters Guides (4 Book Set) 6
- ☐ MASONS AND BUILDERS GUIDES (4 Book Set) 6
- ☐ PAINTERS & DECORATORS MANUAL, 450 Pgs. 2
- ☐ HOUSE HEATING GUIDE, 1000 Pages 4
- ☐ OIL BURNER GUIDE, 384 Pages 1
- ☐ HOME APPLIANCE SERVICE GUIDE, 800 Pages 4

Name_____

Address_____

Occupation_____

Employed by_____ S6

If You Can Light a Match...You Can MAKE UP TO $1,000.00 AND MORE IN A MONTH

Amazing...New...Super Sensitive

MERLITE FIRE ALARM

HOWLS 1/5 MILE WARNING When You Hold a Lighted Match Near It

Make sensational 3-second "Lighted Match" Demonstration, pocket biggest earnings of your life, full time or spare time! Simple test proves new Merlite Fire Alarm so sensitive to fire, a lighted match "triggers" the unmistakable irritating "howl," audible 1/5 mile away! No installation, no connection to house current (which can fail in fire); self-contained. Hang on wall like a picture, always on guard. Only $4.95, less batteries. Homes, farms, stores, offices, factories buy 4 to 12 at a time when you show how Merlite "smells" any fire before danger point. Make up to $2.70 on each one; up to $1,000 and more profit in a month!

FREE: Rush name, address for exciting money-making facts, complete Illustrated Sales Kit FREE—everything you need to make money first day. If you wish Merlite Fire Alarm Demonstrator, complete with batteries ($3.50), send no money, we send C.O.D. Or enclose $3.50 and we pay shipping charges. Money-back guarantee. Many localities now open—write TODAY! **Merlite Industries (Fire Alarm Div.), 114 E. 32nd St., Dept. F-16G, New York 16, N. Y.** In Canada: Mopa Co., Ltd., 371 Dowd St., Montreal 1, P.Q.

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. ½c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N.Y.

60 POWER TELESCOPE $3.98

VARIABLE EYEPIECE 20X-40X-60X—BRASS BOUND

NEW! Three telescopes in one, 3 different magnifications, 20 power for ultra-bright images with 40 and 60 power for extra long range. Guaranteed to bring distant objects, people, sports events, ships, moon, stars, etc. 60 times as close. Most powerful for anywhere near the money. 5 sections. Closes to 1 ft. long. Contains 4 ground and polished lenses.

Also used as a powerful compound microscope. Directions included. Mass production enables to offer this instrument at amazing price of $3.98 complete. Moneyback gaurantee. We pay postage. Get yours today.

Criterion Co., 331 Church St., Hartford, Conn., Dept. PSB 36

I'll Send You This Handsome SAMPLE CASE-FREE

and Show You How to Make Up to $30.00 in a Day

Mail coupon for this Free Tailoring Sample Case packed with 150 beautiful, big-value suit and overcoat fabrics. Take orders from friends, fellow-workers, others, for fine quality, made-to-measure clothes. Pocket big cash profits in advance. Because wearing our suits and overcoats brings more orders, we make it easy for you to get your own clothes without 1c cost. No experience is needed. SATISFACTION GUARANTEED. SEND NO MONEY. Just fill out and mail coupon—today!

PROGRESS TAILORING CO., 500 S. Throop St. DEPT. T-220 - CHICAGO 7, ILLINOIS

PROGRESS TAILORING CO., Dept. T-220
500 S. Throop St., Chicago 7, Ill.

Dear Sir: I WANT A MADE-TO-MEASURE SUIT TO WEAR AND SHOW, without paying 1c for it. Rush details and Sample Kit of actual fabrics, ABSOLUTELY FREE.

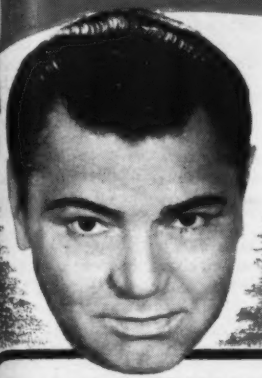
NAME_____ AGE_____

ADDRESS_____

CITY_____ STATE_____

Prepare Now... in spare time at Home ... for a New,

PROFITABLE, INTERESTING FUTURE in TELEVISION RADIO - ELECTRONICS



RADIO CHIEF OF ILE DE FRANCE
FRENCH LUXURY LINER PRAISES D T I

Radio Chief—Jean Desmas Says:

"Your Training Organization in Chicago is known not only throughout Europe, but also in many parts of the world as one of America's finest Television, Radio and Electronics training centers."

JACK DEMPSEY

Former World's Heavyweight Champion
TELLS WHY HE'S PROUD TO BE WITH D T I

- *I have been greatly impressed with D T I's wonderful spirit of friendliness and sincere determination to help its students make good in Television-Radio-Electronics.*
- *I admire its remarkable 25 year record of helping men build brighter futures.*
- *I also admire the business policy of its management and the thoroughness of its large faculty of instructors.*
- *Never have I heard young men praise a school as enthusiastically as do the students and graduates of D T I They are its best boosters.*

Prepare At Home Or In Our Chicago Laboratory!

See for yourself how readily you may prepare at home, or in our modern Chicago laboratories, for a good job or business of your own in one of America's most promising, fast-growing fields—TELEVISION-RADIO-ELECTRONICS.

If you train at home you get (1) the use of a 16-mm. movie projector and 16 reels of animated movies to help you learn important points faster . . . easier, (2) modern, well illustrated lessons and (3) sixteen shipments of electronic parts enabling you to get valuable practical experience from over 300 projects—including building and keeping the electronic equipment shown below. And upon completing training, you have the optional privilege of building and keeping a big 21 INCH TV Set. (D T I offers another home training in Television-Radio-Electronics, but without the TV set.) Get the full story. Mail coupon today!

HOME MOVIES

VACUUM TUBE VOLTMETER

OSCILLOSCOPE

LAUD D T I's HOME MOVIES IN CONGRESS

MILITARY SERVICE!

D T I's remarkable home training benefit of visual training MOVIES has been praised from the floor of the House of Representatives in Washington, D.C. and recorded in the Congressional Record.

If subject to military service, the information we have for you should prove very helpful. Mail coupon today.

"One of America's Foremost Television Training Centers"

89 WAYS TO EARN MONEY IN TELEVISION RADIO ELECTRONICS

MEMBER OF NATIONAL HOME STUDY COUNCIL

MAIL COUPON TODAY!

DeVRY TECHNICAL INSTITUTE
4141 BELMONT AVE., CHICAGO 41, ILL.
Dept. PS-6-M

I would like your valuable information-packed publication showing how I may get started toward a good job or my own business in Television-Radio-Electronics.

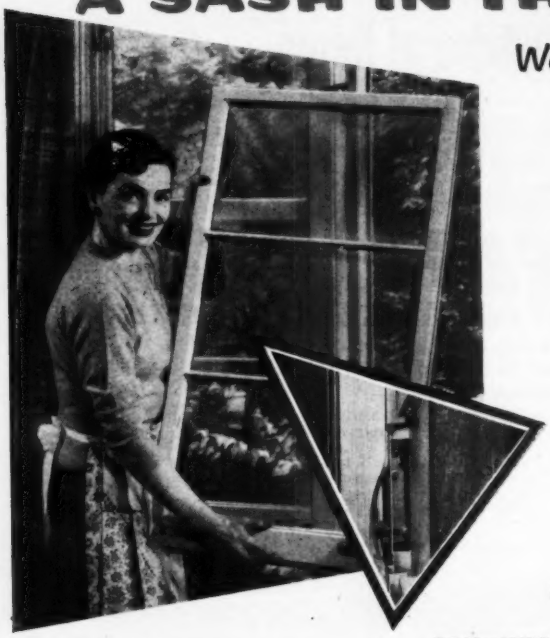
Name _____ Age _____
(PLEASE PRINT)
Street _____ Apt. _____
City _____ Zone _____ State _____

1005 D T I's Training is Available in Canada

DeVRY TECHNICAL INSTITUTE
CHICAGO 41, ILLINOIS
FORMERLY
DeFOREST'S TRAINING, INC.

A SASH IN THE HAND—

Worth two in the frame



REMOVABLE R·O·W WOOD WINDOWS

WITH LIF-T-LOX WINDOW BALANCE

R·O·W windows with new LIF-T-LOX balance remain weather-tight—work with new ease. LIF-T-LOX does not attach to the sash—nothing to interfere with the easy lift-out feature.

See your lumber dealer or write:

R·O·W SALES COMPANY • 1348 ACADEMY
FERNDALE 20, MICHIGAN

R·O·W and LIF-T-LOX are the registered trade-marks of R·O·W Sales Company

---

Save miles and minutes with an

Airguide AUTO COMPASS

Points the right way all the way. Neatly styled for today's smart car interiors. Fits all cars, easy to install and adjust, easy to read.

Super-power Alnico V Magnet and aircraft type compensators assure steady dependable performance under all driving conditions. Three models to choose from —

No. 84 NON-ILLUMINATED $5.95
No. 85 WIRE-ILLUMINATED (by car power) 6.95
No. 86 SELF-ILLUMINATED (with long-life self-contained flash cell) Shown below.... 6.95

CHOICE OF 5 SMART COLORS IN EACH MODEL

Made and Guaranteed by

AIRGUIDE INSTRUMENT CO., CHICAGO 47, ILL.

YOUR OWN BUSINESS with BIG EARNINGS in..

ELECTRIC APPLIANCE REPAIRING

50,000,000 Families Are Your Prospects! Repair electrical appliances for friends and neighbors. Service electrical equipment in stores, etc. Earn up to $5.00-$6.00 an hour or more! New shop method home study training. Electronic Kit makes it now possible. Rush name for FREE Book, and Special PAY LATER form. **CHRISTY TRADES SCHOOL, 4804 N. Kedzie Ave., Dept. D-6401, Chicago 25.**

SEND FOR FREE BOOK!

ENGINEERING B.S. DEGREE IN

DEGREE IN 27 MONTHS

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and ELECTRONIC ENGINEERING (Inc. Radio and TV)

Big Demand for Graduates

Hundreds of young men are earning **B.S. ENGINEERING DEGREES** annually in this recognized institution—year around classes optional. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center.

Low tuition. Competent instruction. Thorough, intense, practical program. Modern, well-equipped laboratories including new physics laboratory and modern wind tunnel. Individualized instruction emphasized.

Government approved for G.I.'s. Engineering preparatory courses. Students from 48 states and 21 foreign countries. Enter June, September, December, March. Send coupon for free catalog and full information. Enroll now.

INDIANA TECHNICAL COLLEGE

666 E. Washington Boulevard, Fort Wayne 2, Indiana

Please send me free information on B. S. Engineering degree in 27 months as checked.

☐ Aeronautical ☐ Chemical ☐ Civil
☐ Electrical ☐ Mechanical ☐ Electronics

Name.....

Address.....

testing laboratories confirm automotive miracle!

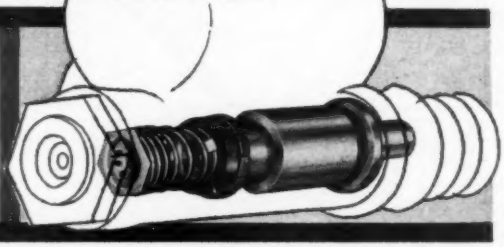
$13.95 JET AIRCRAFT POWER BRAKE DUPLICATES "FEEL" AND POWER INCREASE OF ANY FACTORY INSTALLATION!

lowest priced guaranteed power brake! The JEB Jet Aircraft Power Brake has been developed and tested as to its application on automobiles for over two years. It is actually the result of a happy chance that brought a brilliant aircraft engineer and a discerning automotive expert together in the same firm. The product they developed is rugged, light and precision made in every detail. It fills an emergency need on the nation's highways—allowing you to properly handle your high speed car with its powerful high compression engine in ease and safety—without the prohibitive cost of current installations.

safer—make this test With JEB unit installed drive up or down the steepest hill in your area. Turn off your engine and apply brakes. You have full power no matter how many times you use your brakes. A vacuum power brake will normally exhaust itself after three or four brakings *unless you can start your engine.*

testing laboratories confirm Results of this test show that for a given push on the brake pedal, the JEB Power Brake develops 4 times the hydraulic pressure at all wheel cylinders as does a conventional hydraulic brake system.

FACTORY GUARANTEE The JEB POWER BRAKE is guaranteed to equal in power increase, performance and "feel," *any* vacuum or other power brake now in use on American automobiles. Satisfaction guaranteed or purchase price refunded upon return of unit to factory within 30 days.



ATTENTION MECHANICS:

JEB POWER BRAKE is installed exactly the same as a master cylinder repair kit. Instructions included.

COMPARE this master cylinder repair kit. JEB unit simply replaces standard piston assembly. Spring and valve & seat assembly are identical. (JEB unit includes new pedal linkage.)

HOW IT WORKS The Jeb Power Brake uses a housing which already exists in your car, the master cylinder. When the brake pedal is depressed, two concentric pistons in the JEB Power Brake travel forward at slightly different rates of speed. The inner piston "takes over" smoothly and evenly, applying four times conventional braking power to all drums. This power brake eliminates extra objectionable pedal travel found in many power brakes because the outer piston "takes up the slack" on the fluid while the inner piston applies the quadruple braking power (standard increase in factory installed power brakes) One JEB experimental brake develops 9-to-1 power increase, far too sensitive for the human foot.

The JEB POWER BRAKE also maintains normal pressure in the brake lines at all times, preventing the entry of air at the wheel cylinders. This has been made safer by the use of aircraft "O" ring rear sealing which has an estimated life of 2½ times the regular secondary cup. The JEB unit is machined from bar stock. There are no stamped parts. If this model were produced in limited quantities for the government, it would cost in excess of $200.00. Its precision manufacture reduces overall wear and friction and actually increases the life of the standard parts used in the assembly.

Installed in Master Cylinder in 20 min.

No other connections or attachments. No power drain. Racing drivers: negligible weight increase.

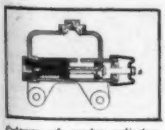
Full Power Brakes-ALWAYS-With Engine ON or OFF

Safer! Eliminates common danger of vacuum loss if engine dies. Stronger! This principle will gently stop a heavy jet coming in at 150 M.P.H. It has been scaled down to accommodate American passenger automobiles. The safety factor is enormous.

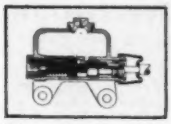
Made with New U.S. Government Approved Process

For longer brake life under adverse conditions, new Sanford process has been carried over to JEB automotive models. Prevents electrolytic disintegration which now takes place in all master cylinders.

fast braking power to spare for all cars including heaviest cadillacs, lincolns, chrysler imperials — guaranteed



Cutaway of master cylinder with conventional kit installed



Cutaway of master cylinder with jeb power brake installed

jeb power brake kit includes

1. Valve and seat assembly. 2. Primary cap. 3. Power brake unit completely assembled. 4. Spring. 5. Lock ring 6. Boot. 7. Proper pedal linkage for your car is included.

DEALERS & DISTRIBUTORS: Write or wire for details on the revolutionary JEB Jet Aircraft Power Brake.

ORDER COMPLETE FACTORY TESTED KIT BY MAIL TODAY

JEB INDUSTRIES
Automotive Sales Offices
4641 Hollywood Blvd.
Los Angeles 27, California

Gentlemen: Please mail postpaid ___ Jeb Jet Aircraft Automotive Power Brake Kit(s). Complete with pedal linkage (total kit $13.95 postpaid). Or send $2, balance C.O.D.

Make of my car is _____ Year _____

Model _____ I enclose $ _____ check, cash or m.o.

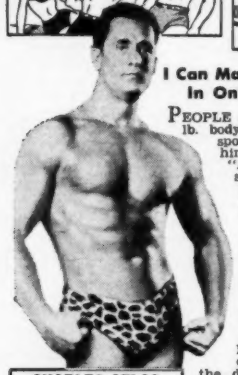
Name _____

Address _____

City _____ Zone _____

State _____

Calif. resid. add 4% state tax.



CHARLES ATLAS
Holder of title, "The World's Most Perfectly Developed Man"

I Can Make YOU a New Man, Too In Only 15 Minutes a Day!

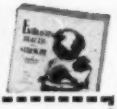
PEOPLE once laughed at my skinny 97-lb. body. I was ashamed to strip for sports. Girls made fun of me behind my back. THEN I discovered *"Dynamic Tension."* It made me such a complete specimen of manhood that I hold the title, "The World's Most Perfectly Developed Man."

What's My Secret?

When you look in the mirror and see a healthy, husky, handsome, fellow smiling back at you—you'll be amazed at how fast *"Dynamic Tension"* GETS RESULTS. It's the easy, NATURAL method you can practice in your own room—JUST 15 MINUTES EACH DAY. No gadgets to fool with. You simply use the dormant muscle-power in your own body—watch it grow into solid LIVE MUSCLE. See your shoulders broaden . . . your scrawny chest swell with *inches* of new muscle . . . those spindly legs and arms bulge with new power . . . and your whole body starts to feel "alive," full of zip and go!

FREE MY 32-PAGE ILLUSTRATED BOOK IS YOURS—NOT FOR $1 OR 10c—BUT FREE

Send now for my book, *Everlasting Health and Strength*. 32 pages of photos, valuable advice. Shows what *"Dynamic Tension"* can do for YOU. Answers vital questions for fellows who want a better build. It's yours—ABSOLUTELY FREE! Rush coupon to me personally:
CHARLES ATLAS, Dept. 16, 115 East 23rd St., New York 10, N. Y.



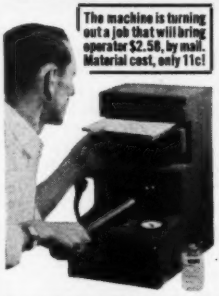
CHARLES ATLAS, Dept. 16,
115 East 23 St., New York 10, N. Y.
Send me—absolutely FREE—a copy of your famous book, *Everlasting Health and Strength*—32 pages, crammed with photographs, answers to vital questions and valuable advice. This book is mine to keep, and sending for it does not obligate me in any way.

Name_____ Age_____
(Please print or write plainly)
Address_____
City_____ State_____

MAGIC MAIL PLAN

that comes with this Little Machine

CAN MAKE YOU $5.00 AN HOUR



Write today for free facts about the newest and most fascinating of all new home operated businesses. For the first time, a simplified machine brings the fabulous profits of Plastic Sealing and Plastic Laminating within reach of the small operator. Anyone can learn to operate it with a few minutes practice. Then—with our MAGIC MAIL PLAN—can get mail orders pouring in daily with cash in every envelope.

No Canvassing or Selling

Fill orders at home in spare time to start. Then expand to full time business. We even supply circulars to bring back cash and orders. Rush name for all the facts you need to start. A postcard will do. No charge.

WARNER ELECTRIC CO., Dept. L-48
1512 Jarvis, Chicago 26, Illinois

MAKE BIG PAY OR OWN A BUSINESS

***Learn* AIR CONDITIONING AND REFRIGERATION**

Play safe—choose your future in Air Conditioning, a billion-dollar industry that's growing every day. New CTI Shop-Method plan teaches installation and repair at home. You get 23 practical training kits—motor, compressor, gauges, controls, refrigeration hi-side, tools, supplies. You build an air conditioner, freezer, refrigerator or milk cooler. Write today for FREE BOOK.

COMMERCIAL TRADES INSTITUTE, Dept. R-281
1400 Greenleaf Ave. Chicago 26, Illinois

LAW

Men and Women STUDY AT HOME for Business Success and LARGER PERSONAL EARNINGS, 44 years expert instruction—over 114,000 students enrolled. LL.B. Degree awarded. All text material furnished. Easy payment plan. Send for FREE BOOK —"Law and Executive Guidance"—NOW!

AMERICAN EXTENSION SCHOOL OF LAW
Dept. D-14, 201 North Wells Street, Chicago 6, Ill.

FREE! 100 FOREIGN STAMPS

All genuine, unpicked, unsorted — just as received from Europe, Asia, Africa, Near East, Far East — from everywhere! Plus a beautiful souvenir of World's Rarest Stamp and our valuable "Stamp Collector's Guide". Other valuable offers also included for your FREE inspection!

Send 10c for postage and handling to
GARCELON STAMP CO., DEPT. 6PSM
CALAIS, MAINE

High School at Home

MANY FINISH IN 2 YEARS

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 59 year-old school. Send for FREE descriptive booklet.

AMERICAN SCHOOL, Dept. HA46
Drexel at 58th St., Chicago 37, Ill.
Without obligation, please send FREE descriptive booklet.

Name.....

Address.....

Complete Canadian Courses available. Write American School, Dept. HA46, 1610 Sherbrooke St. W., Montreal

NATIONAL SCHOOLS

proudly presents

FOR MEN WHO WANT TO EARN MORE MONEY

TELERAMA* • ALL 8 BRANCHES OF TELEVISION • ELECTRONICS • RADIO

IN ONE DYNAMIC, MODERN SHOP METHOD, HOME TRAINING COURSE

*Registration applied for

Another great advance in **HOME STUDY TRAINING.** Let National Schools, of Los Angeles, a practical Technical Resident Trade School for over 50 years, train you at home by Shop-Method, for today's unlimited opportunities in **ALL 8 BRANCHES** of the Television, Electronics, Radio Industry

Check all you receive in *One Master Course* at One Low Tuition

1. **Television — Including Color TV**
2. **Radio — FM and AM**
3. **Industrial Electronics**
4. **Sound Recording and Hi-Fidelity**
5. **Preparation for FCC License**
6. **Automation**
7. **Radar and Sonar**
8. **Communications**

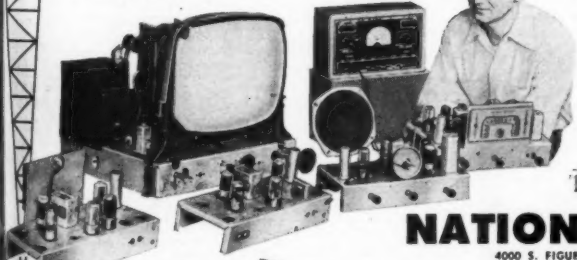
ALL OF THIS MODERN, NEWEST, PRACTICAL EQUIPMENT IS YOURS TO KEEP!

- Parts to Build a modern TV set, including large screen Picture Tube.
- Parts to build a powerful Superhet Receiver, standard broadcast and short wave.
- Parts to conduct many experiments and build Continuity Checker, RF Oscillator, TV Circuits, Audio Oscillator, TRF Receiver, Signal Generator.
- Professional Multitester
- These are a MUST for all technicians.

YOU DO MANY PRACTICAL JOBS. You do servicing, circuit analysis and many other down-to-earth experiments. You build a modern TV set from the ground up . . with equipment kits we give you, including a new large screen picture tube and professional Multitester, at no additional charge.

EARN AS YOU LEARN! Many of our students earn their entire tuition and more in Spare Time jobs we show them how to do while learning. YOU GET GRADUATE ADVISORY SERVICE, TOO.

ALL YOURS TO KEEP



L. J. ROSENKRANZ
President of NATIONAL SCHOOLS

This Master-Shop-Method course is completely up-to-date Here in Los Angeles, the TV and Electronics center of the world, we are able to keep in constant touch with the industries' latest developments. As a student, you will quickly master all phases at home . . . in your spare time. Your earning power will grow with every lesson Just as thousands of National Schools graduates do every day, you can handle servicing, manufacturing, repairing, hundreds of other jobs, or make good money in your own business. SECURE YOUR FUTURE—NOW. SEND COUPON BELOW.

IN THESE MODERN TV STUDIOS, SHOPS AND LABORATORIES, your Shop Method Home Study Course was developed by experienced instructors and engineers. What an advantage that is to you at home — each lesson is tested, proved, easy to understand. You can master the most up-to-date projects, such as color TV set repair, printed circuits — even prepare for F.C.C. License and industrial electronics without taking a special course. TAKE YOUR FIRST STEP NOW TO A TOP-PAY JOB IN TV, ELECTRONICS, RADIO. SEND COUPON BELOW TODAY.

APPROVED FOR VETERANS AND NON-VETERANS

NATIONAL SCHOOLS

4000 S. FIGUEROA ST., LOS ANGELES 37, CALIF
187 N. LA SALLE ST., CHICAGO 1, ILL.
IN CANADA: 811 W. Hastings St., Vancouver, B. C

MEMBER

FREE! Fully Illustrated "CAREER" BOOK in TV, Radio, Electronics, AND actual Sample lesson—yours at no cost, no obligation SEND COUPON NOW—TODAY!

NATIONAL SCHOOLS
TECHNICAL TRADE TRAINING SINCE 1905
Los Angeles, California

GET FAST SERVICE—MAIL NOW TO OFFICE NEAREST YOU

NATIONAL SCHOOLS, DEPT. RC66
4000 S. FIGUEROA ST. LOS ANGELES 37, CALIF. OR 187 N. LA SALLE ST. CHICAGO 1, ILL.

Rush free TV-Radio "Opportunity" Book and sample lesson. No salesman will call.

NAME _____ BIRTHDAY _____ 19__
ADDRESS _____
CITY _____ ZONE _____ STATE _____
VETERANS: Give Date of Discharge _____

94.6% OF BAILEY GRADUATES ARE EMPLOYED AT TOP PAY IN THE FIELDS WHICH THEY WERE TRAINED!

DIESEL-AUTO MECHANICS DESPERATELY NEEDED!

We have a far greater demand for our students than we can fill!

We can show you an actual waiting list of leading companies throughout the world who have tried Bailey graduates — found them outstanding, and are coming back for more!

Bailey Graduates are Successful . . . RECEIVE BIG PAY — HAVE SECURE FUTURE!

The Famous Bailey Course prepares you for BOTH Diesel and Gasoline Mechanics.

This is a **must**—due to the advent of using Diesel principles, such as 'Fuel Injection' on passenger cars . . . use of gasoline engines for starting Diesel engines, etc. You learn all this at Bailey in the amount of time ordinarily required to learn just one of these subjects, **ALL FOR THE PRICE OF ONE.**

Don't be satisfied with a 'futureless', one-type job — learn how you can make **big money** now!

Write today for Free Booklet that takes you on a step-by-step camera tour through our spacious, modern shops — See Bailey students in action as they Learn-by-doing with the Famous Bailey Method of training!

We provide you with housing and part time jobs while in school, plus nation-wide placement service for graduates.

BAILEY Technical SCHOOLS

1650 S. GRAND ST. LOUIS 4, MO.

MAIL TODAY!

Please mail immediately this free booklet without obligation.

FREE BOOKLET

Name.....

Address.....

City.....State.....

APPROVED FOR VETERAN . . . NON-VETERAN

End Extension Cord Tangle!

REVOLUTIONARY, NEW, PORTABLE "HANDYREEL"

For Electrical Extension Cords

Pull Out Any Length!

IDEAL FOR:

Home-owners, farmers, carpenters, electricians, plumbers, painters, etc.

Sturdy, lightweight construction. "Handyreel" supplies current up to 300 ft. for electric power tools, saws, drills, lawn mowers, trimmers, fans, sprayers, pumps, lights, etc. Keeps cords like new. Steel drum. Welded stand. Adjustable brake. Easy-carry handle. Holds 300' # 16, 200' # 14. 14" wide, 12½" high. Shipping Wt. 5 lbs. Satisfaction guaranteed, order today!

ONLY **7.95** POSTPAID

LAKESHORE PRODUCTS
WOODINVILLE, WASH.

SOLD LESS CORD

YOU BUILD 'EM—WE SELL 'EM EARN UP TO $50.00 A DAY AT HOME

Participate in our national sales and sub-contract plan—spare time—full time. You assemble special luggage and cases for photographers, musicians, salesmen, and all types of portables. We supply complete instructions—materials—tools—everything. No previous experience necessary. Free details. Abarsi Casecraft, Dept. CG, 807 W. Sunset Blvd., Los Angeles 12, Calif.

LEARN PLASTICS

COMPLETE LOW COST SHOP METHOD HOME TRAINING NOW AVAILABLE

Get in on Big Money opportunities in Plastic molding, casting, forming, carving, etc. Earn as you learn with Interstate's professionally prepared course. All plastic materials furnished.

WRITE FOR FREE BOOKLET

INTERSTATE TRAINING SERVICE
DEPT. C-2, PORTLAND 13, OREGON

BOWHUNTERS' OUTFITS

Save by mail! Sets include custom-grade laminated bows, matched arrows, top-brand quivers, etc. Also complete line glass bows, archery equipment. Terrific values! Amazing FREE TRIAL plan! Investigate!

SAVE 50%

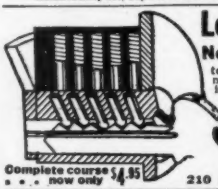
Complete Sets $16.00 up

FREE! "How to Choose a Bow" Booklet and Catalog

HOW TO CHOOSE A BOW

Malibu Archery Co., Dept. N-G 1036 S. La Brea, Los Angeles 19, Calif.

Locksmithing AND KEY MAKING



Now Made Easy! Practical up-to-date course teaches you how to pick locks, de-code, make master keys, repair, install, service, etc. New self-instruction lesson for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 easy illustrated lessons. Full price only $4.95, postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Complete course $4.95 . . . now only

Nelson-Hall Co., Dept. FU-1
210 S. Clinton St., Chicago 6, Ill.

CHEMISTRY

BIG LABORATORY GIVEN FREE!

Be a **CHEMIST!** One of the really **GREAT** professions! We teach you at home. Simplified (but thorough) course; no previous training required. Earn while you learn. This is the **GOLDEN AGE** for those with special knowledge! Diploma awarded! Send 25c for first lesson and KIT or $1.00 for first 5 lessons and supplies including

FREE! **URANIUM TESTER, CHEMICAL PUZZLE** (worth $2.50) and **HOW TO MAKE 100 NEW CHEMICALS!**

NATIONAL SCHOOL OF CHEMISTRY
P. O. Box 606-B Redwood City, Calif.

Pellet Shooting Automatic

Shoots 10 pellets as fast as you pull trigger. For indoor target work & fun. **Automatic action.** Holds 10 pellets. **Full size model of Colt .45.** 6½-in. long. Plastic moulded. Moving parts of die cast metal. With supply of pellets. (Extra Pellets, 25c Pkg. Holster 50c) **EACH** . . . **$1.65**

Johnson Smith & Company, Dept. 318, Detroit 7, Mich.

Catalog OF 3000 Novelties 10c

Send 10c for amazing catalog of novelties, live animals, scientific supplies, hobbies, funmakers, planes & boats, looms, magic tricks, joke articles, unusual seeds, gadget timesavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, auto & bike accessories, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, books, games, plants, etc. Send name, address & 10c to:

JOHNSON SMITH & CO., Dept. 318 Detroit 7, Michigan

10-Foot BULL WHIP

HARD HITTING! LOUD CRACKING! Experts knock ashes off cigarets. Yank people off feet. Used by trainers, ranchmen. **Loud cracker like a shot-gun blast.** 4-ply hand plaited all leather. With handle loop.

6-ft. whip $1.98. 8-ft. $2.69. 10-ft. $3.29

JOHNSON SMITH COMPANY Dept. 318 Detroit 7, Mich.

POWER MOWER KITS FREE PLANS

3 or 4 Wheel Model

Have one of the finest mowers money can buy. Write for FREE PLANS and PARTS LIST showing you how to SAVE MONEY by assembling Triangle's POWER MOWERS.

SPECIAL FACTORY PRICES

Kits, Parts, Engines, Wheel, etc. 18" and 20" sizes; 3 or 4-wheel models; belt or direct drive. Latest improvements, sturdy construction, money-back guarantee fully told in FREE color folder. Also complete TRIANGLE MOWERS ready to mow at low Factory Prices. Write today.

TRIANGLE MFG. CO. Dept. SA-66, Ft. Scott, Kan.

REAL ESTATE — BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your **own business quickly.** Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in classrooms in leading cities. Diploma awarded. Write TODAY for free book! No obligation.

FREE BOOK TELLS HOW

Approved for World War II and Korean Veterans

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)

2020S Grand Ave. Kansas City, Mo.

Secrets of VENTRILOQUISM Now Revealed!

Easy to learn in 60 to 90 days with our Home Study Course. **RESULTS GUARANTEED. Make Money! Be Popular! Have Fun! Big Opportunity!** Radio, Television, Stage Appearances! For Free Information regarding price and terms, WRITE. You must state your age. Dummy Catalog 25c.

FRED MAHER SCHOOL OF VENTRILOQUISM Box 36, Studio PS-6, Kensington Station Detroit 24, Michigan

LUGER AUTOMATIC Wholsale $2.98

6.50 MM.
10 SHOT MAGAZINE

Designed by Master Craftsman from the famous German Fast Shooting Automatic Luger!! No C.O.D's

Be the proud owner of this **Exciting Automatic** and the envy of your friends! Finished in sleek blue-black of high impact #475 Styron with fancy polished-chromium-type steel trigger!!

Sharp looking—simulated knurled **Ivory Grips!!** Not an air or CO2 gun. **Fires 10 slugs in rapid succession!! FREE—Surprise Package! Plus** 100 slugs with order of 2 Lugers at **$5.95.**

Order Now—while they last. Be a two-gun man!

KRIEGER LABS, PS 1708 N. McCadden Pl., Hollywood 28, Cal.

LAW TRAINING FOR BUSINESS

(*In spare time at home*)

Earn LL.B. Degree

Thousands of men and women who never intend to practice Law are studying it in spare time at home as an aid to business advancement.

Today Law is involved in practically every business decision. In many lines of work it is almost indispensable. Law training develops keen, clear, quick, correct and decisive thinking.

You can study LaSalle's American Law and Procedure right in the privacy of your own home—progressing as rapidly as your time and ability permit. For nearly 50 years we have helped over 1,350,000 ambitious people get ahead in the business world.

A MOST UNUSUAL LAW LIBRARY

This training includes the 14-volume LaSalle Law Library—AMERICAN LAW AND PROCEDURE—that is the basis of all our instruction service. This library has been compiled by leaders in the field of Law. It covers the whole field in an orderly and simple manner that is easy to learn and understand. Collateral reading and printed lectures, furnished at regular intervals, supplement the texts. Law instructors personally supervise your program. Under the LaSalle method you learn by actually solving legal problems—not just memorizing rules.

WRITE FOR TWO FREE BOOKS

Send the coupon below TODAY and find out how you can qualify for the many fine openings available to the law-trained man. In our FREE books "Law Training for Leadership" and "Evidence" you will find answers to your questions about the study of Law and the LaSalle method.

—MAIL COUPON TODAY—

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn St. Dept. 683L Chicago 5, ILL.

Please send me, FREE, "Law Training for Leadership" and "Evidence."

Name. . . . . .

Address. . . . . .

City. . . . . *Zone*. . . . *State*. . . . . .

Now You can afford this Award swimming pool in your own BACKYARD!

Revolutionary Award Pools, America's finest, cost up to $700 less to install.

Exclusive laminated **BOLTAFLEX*** sheathing by **GENERAL TIRE & RUBBER CO.** saves hundreds of dollars in maintenance and servicing. Eliminates upkeep expense... gives full protection from algae, fungus, slime. No cracking, seepage, rust, discoloring... completely waterproof. *Never needs painting or draining. Always sparkling clear.*

ONLY $795.00 12 x 27 ft. 6½ ft. deep

For the first time the Award Pool is now also available in a DO IT YOURSELF KIT complete with Boltaflex Liner—Filtration system—Illustrated Building Manual and Instructions—Plans—Drains and Fittings. Unconditionally guaranteed by the largest manufacturer of Bolta-lined pools in America. Mail coupon for complete details.

DAVIS PRODUCTS INC., Dept. PS-66
1631 Tenth St., Santa Monica, Calif.

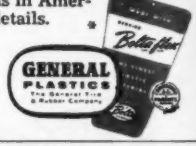
Name_____

Address_____

City_____ Zone_____ State_____

☐ Send Do It Yourself Kit Information ☐ Send name of nearest Award Dealer

DAVIS PRODUCTS, INC.
Award Pools
DIVISION
1631 Tenth St., Santa Monica, Calif.



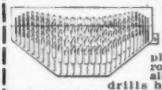
75c ea. for Finest Imported PRECISION PLIERS

- Flat Nose
- Combination
- Diagonal Cutter
- End Cutting Nippers
- Round Nose
- One Side Flat—One Side Round
- Snipe

FOR JEWELERS, OPTICAL WORKERS, HOBBYISTS, CRAFTSMEN OF ALL KINDS! These superb German instruments are of deep-forged, heat-treated high quality tool steel, fabricated to most exacting specifications. All-over ground and polished to smooth hard surfaces. Smooth working joints with just the right tension. Jaws meet perfectly to safely and securely hold even the most delicate objects in the hard-to-reach corners and angles. Each plier is 4" long and a veritable gem of precision and strength.

75c ea.... all 7 for $5.00 ppd.

CHROME VANADIUM 29 Pc. DRILL SET



Specially made for speed drilling. In sturdy plastic tool roll. Finest alloy steel drills hardened and precision ground to the sharpest, longest lasting cutting edge obtainable; will easily and cleanly bite through hardwoods, plastics, aluminum, iron and the toughest steels. Unconditionally guaranteed for thousands of drillings. Full jobber length.

Sizes by 64th from 1/16 to ½". NOW **$6.49 ppd.**

Also available with Turned Down Shanks to fit all ¼" drills. In individual pocket roll..... **$8.95 ppd.**

Arco HOLE SAW with AUTOMATIC SLUG EJECTOR. 4 saws in 1

Fits any electric drill, drill press, lathe, motor. Automatic slug ejector pops out slug immediately. Works 3 times as fast as other hole saws that sell for twice as much! Cuts 1", 1½", 2" and 2½" holes cleanly, accurately. Cuts wood, plastics, metals, formica, wall board, etc. Has extra grooves in tool head to accommodate 1¼", 1¾" and 2¼" blades. Consists of sturdy alloy tool head, 4 finest quality shatterproof blades, automatic slug ejector and ¼" drill bit. **$4.95 ppd.**

DELUXE ARCO HOLE SAW—Same as above but has 7 blades, cuts 1", 1¼", 1½", 1¾", 2", 2¼" and 2½" holes. **$6.50 ppd.**

60 Pc. Set Wire Gauge CHROME VANADIUM DRILLS

Top quality high test Chrome Vanadium Drills designed for speed drilling through toughest steels, woods, plastic, iron and aluminum. Precision ground, long-lasting cutting edges. Guaranteed to give years of satisfaction. A full 60 pc. set nos. 1 through 60.

A $14.95 value—NOW ONLY..... **$5.40** plus 35c pp. & hdlg.

Same set above available with Huot Index container—Only..... **$6.65** plus 35c pp. & hdlg.

Send check or money order. If C.O.D. fee extra.
Money Back Guarantee.
SCOTT-MITCHELL HOUSE, INC.
Dept. M-207 611 Broadway N. Y. 12, N. Y.

WELD YOUR WAY AHEAD!

Learn Arc and Gas Welding In Spare Time

Your opportunities are greater when you learn to use this great tool of modern industry. Training in welding opens the door to many key industries. Now you can train at home with UEI's practical course. Includes techniques, metallurgy, blueprints, shop practices, other important phases.

Write For FREE Facts! You can follow home-study training with actual shop practice. High school diploma not necessary. Write NOW!

UTILITIES ENGINEERING INSTITUTE
2523 Sheffield Ave., Dept. WM-7, Chicago 14, Ill.

Reg. U.S. Pat. Off.

BUILD 16 RADIO

CIRCUITS AT HOME WITH THE NEW DELUXE 1956 PROGRESSIVE RADIO "EDU-KIT"

A PRACTICAL HOME RADIO COURSE only **$19.95**

Learn practical electronics theory, construction, trouble-shooting. Build 16 Receiver, Transmitter, Signal Tracer, Code Oscillator, Signal Injector Circuits at home. Excellent background for TV. No knowledge of radio necessary. "Edu-Kit" includes all radio parts, punched metal chassis, Printed Circuit materials, instruction manuals, electric soldering iron, Tester, Tools, High Fidelity Guide, TV Book, Quizzes, Tester Instruction Manual, Membership in Radio-TV Club; Consultation Service, Unconditional Money-Back Guarantee.

PROGRESSIVE "EDU-KITS" INC.
497 Union Ave., Room 542A, Brooklyn 11, N. Y.

MAIL COUPON OR POST CARD

Rush me FREE Descriptive Literature concerning "EDU-KIT." Also send me FREE Radio, TV, Hi-Fi Servicing Literature. No obligation.

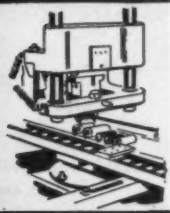
NAME_____

ADDRESS_____

MEN 17-55!
HERE'S A NEW OPPORTUNITY FOR YOU!

Industrial Processing

PREPARE AT HOME FOR A PROFITABLE CAREER IN AUTOMATION ELECTRONICS*



Making Electronic devices

Recording and billing

Get in on the Ground Floor of this Fast-Moving Field

Want a better job? . . . more money? . . . better working conditions? These are the things that can come to a man when he has a *skill* to offer . . . especially when that skill is in a newer field where ground floor opportunities often lead to well-paying positions. Such a field is the Electronic applications to AUTOMATION — and *what a field!*

Many plants, large and small, in various parts of the country are looking for ways of using automatic electronic control equipment to help turn out a better product and at lower cost. This equipment must be designed, installed and maintained — calling for well trained men. That's where YOU may come in!

You need no special technical experience . . . no previous knowledge of Automation Electronics . . . to prepare for a future that can be bright and more secure. For now there is a proved way to get this important know-how. Mail coupon for complete details. Men 17 to 55 preferred.

***WHAT IS AUTOMATION ELECTRONICS?**

Simply stated, this refers to the marvelous electronic controls that will help regulate the much talked about "automatic factory"—as well as other amazing automatic equipment in plants, offices and elsewhere. It is a gateway to some of the most desirable opportunities in the amazing, newer field of Automation.

A New Training Program!

As one of the leading organizations of its kind, the DeVry Technical Institute has years of experience in teaching Electronics, Television and Radio. So *it* is only natural for this training institute to develop a new program to prepare men for good jobs in instrumentation — as well as in the design, installation and maintenance of Electronic controls — as applied to Automation.

EMPLOYMENT SERVICE

Following the same proved method used to train thousands of other men, you get valuable practical experience from actual electronic equipment. You also receive well-illustrated texts and effective moving pictures to show important basic principles—a wonderful home training advantage! To top that off, DTI provides actual employment help when you have completed the training—all of which can open the way to many new and exciting opportunities.

Member of National Home Study Council

Anti-aircraft gun control

Traffic control signals

ONE OF AMERICA'S FOREMOST ELECTRONICS TRAINING CENTERS

DeVRY TECHNICAL INSTITUTE
CHICAGO 41, ILLINOIS
FORMERLY
DeFOREST'S TRAINING, INC.

MAIL THIS COUPON TODAY!

DeVRY TECHNICAL INSTITUTE, Dept. PS-6A-M
4141 Belmont Avenue, Chicago 41, Ill.

I would like further information about the newer Electronic opportunities in AUTOMATION, also facts on how you may help me to prepare.

Name_____ Age____
Please Print
Street_____ Apt.____
City_____ Zone____ State____

1012 DTI's training is available in Canada

DRAFTSMEN

CASH BIG PAY CHECKS!

Train Now for more success, greater security

LEARN AT HOME IN SPARE TIME
(or at college in Chicago)

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed. Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION—MAIL COUPON TODAY!
Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

CHICAGO TECHNICAL COLLEGE

G-224 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois
Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name.....Age.....

Address.....

City.....Zone....State.....

Inventors

Sketch and describe your invention. Sign, date and have this disclosure witnessed by two people who understand your invention. Have us make a preliminary search among U. S. patents already granted for similar types of invention. We report on the probable patentability of your invention and recommend your further course of action.

Write for our instructive booklet, "Patent Protection for Inventors" and our convenient "Evidence of Invention" disclosure form.

VICTOR J. EVANS & Co. *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
240-G MERLIN BUILDING, WASHINGTON 6, D. C.

INVENTORS

PROTECT YOUR INVENTION BY A U. S. PATENT. SEND FOR FREE "INVENTION RECORD" FORM AND "PATENT INFORMATION EVERY INVENTOR SHOULD HAVE".

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 35th FLOOR, 66C
NEW YORK CITY

INVENTORS

I shall be pleased to furnish you, upon request, with information relative to patent procedure—without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

PATENTS

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
426 SNOW BUILDING, WASHINGTON 1, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.

INVENTORS

Send for
PATENT INFORMATION
Book and
INVENTOR'S RECORD
without obligation
GUSTAVE MILLER
66 PS WARNER BUILDING
WASHINGTON 4, D.C.

REGISTERED PATENT ATTORNEY
ASSOCIATE EXAMINER
U.S. PAT. OFF. 1922-1929
Patent Attorney & Advisor
U. S. NAVY DEPT. 1930-1947
PATENT LAWYER

THE **Big Favorite**®
SANFORIZED
WORK CLOTHES

Home Craftsmen And Do-It-Yourself Fans—
Make neat, longwearing Big Favorite work and leisure clothes your "uniform" for workshop and do-it-yourself jobs. Many fashionable, practical styles.

25,000 DEALERS, COAST TO COAST

Satisfaction or Refund of Money
Guaranteed by Good Housekeeping
If Not As Advertised Therein

American Institute of Laundering
Certified Washable

THE FAVORITE GARMENT CO. Lynchburg, Va. Jackson, Miss.

New Spark Plug Invention!

SELF-CLEANING, 21 POINT Nickel-Cadmium SPARK PLUG

TESTS PROVE:
- ★ 10 HORSEPOWER GAIN
- ★ 9 MPH GREATER SPEED
- ★ 15% FUEL SAVING

OIL INDUSTRY RESEARCH DISCOVERS AMAZING ELECTRODE SECRET

Research engineers of leading oil companies recently revealed that nickel-cadmium is the most perfect material yet developed for the electrodes of spark plugs designed for modern high-compression, internal combustion automobile engines. The nickel-cadmium solid electrode of the Life-Long Plug has ideal characteristics of extremely high conductivity and durability, being able to withstand temperatures of 3500° indefinitely.

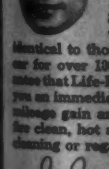
BUILT-IN CADALLOY CATALYST

These same research engineers also discovered that a new alloy (which we call Cadalloy) introduced into the combustion chamber of a plug, acts as a catalyst to produce the most efficient fuel combustion. Life-Long Plugs are the first to use this important discovery!

THE INSULATOR... High-voltage patented Ebanite® Insulator, developed and used only by Life-Long, has a hardness in the same range as precious jewels. You can identify Life-Long Plugs by the black insulators. This costly new material has 20 times higher thermal conductivity than ordinary insulators.

THE BUSINESS END ...New type solid electrodes have no points to burn off! The "business" end of Life-Long Plug utilizes unique nickel-cadmium electrodes to produce fuller, hotter spark arcing from 21 or more points and spreading around the full 360° circle. Life-Long Plugs have approximately 40 times more firing surface than conventional one-electrode plugs, giving more efficient, even combustion.

THE SHELL... Made of a new alloy developed specifically for Life-Long by modern metallurgy. Unlike old style 2-piece shells, the Life-Long shell is one precision-machined piece fused to the Ebanite insulator under tremendous hydraulic pressure and induction to make a positive seal. This prevents "blow-by," major cause of failure in plugs with 2-part shells.



Bonded Guarantee

"I certify that the set of self-cleaning, 21 pt. Life-Long Nickel-Cadmium Spark Plugs you will receive are identical to those used in my own car for over 100,000 miles. I guarantee that Life-Long Plugs will give you an immediate horsepower and mileage gain and will continue to fire clean, hot and steady without cleaning or regapping."

J. M. Watt

J. M. WATT, President
LIFE-LONG SPARK PLUG CORP.

Only spark plug guarantee backed by a cash bond held by an independent financial institution (details on request).

OPPORTUNITY FOR DISTRIBUTORS

Many choice territories are still available. All territories are awarded on an exclusive basis, protected by a written franchise. No charge for franchise. Write, wire or phone today. Cable: Sparcorp, Los Angeles.

LIFE-LONG NICKEL-CADMIUM PLUGS ARE GUARANTEED TO:

1—End plug replacement costs
2—Step up engine horsepower
3—Increase your gasoline mileage
4—Improve acceleration
5—Give smoother idling
6—End engine knock
7—Never need regapping

With the introduction of sensational new-type Life-Long Nickel-Cadmium Plugs, the spark plug is no longer the "most troublesome, most often-replaced" part of your automobile. In fact, you will never have to replace the plugs in your car once you install a set of Life-Long Plugs!

LIFE-LONG—WORLD'S ONLY PLUG WITH FULL-CIRCLE FIRING

Life-Long's revolutionary "ring of fire" principle is the first major improvement in plugs in 25 years. Instead of small "spot" spark arcing between the same two points, the Life-Long Plug makes a hot spark 400% to 500% greater in volume, spread around the entire circumference of the solid electrode. The piston stroke of today's high-compression engines is so powerful that it can actually "blow out" the spark produced by old type plugs. Blowing out is impossible with Life-Long's full-circle spark.

Heat is spread around the full perimeter, resulting in cooler electrode temperature. The causes of wear, burning and insulator failure are eliminated.

SELF-CLEANING. Because the Life-Long Plug fires simultaneously inside and outside the shell, fuel mixture is ignited at the same time a powerful turbo wiping action, created by the piston stroke, burns and blows out the carbon. Power loss is prevented and you get greatly increased horsepower and gasoline mileage. In a series of road tests, some cars have shown 10 horsepower gain, mileage increase 15% and more.

PLEASE NOTE: *The Life-Long spark plug is different in every way—not just an "improved" plug, but an entirely new engineering development!*

LIFE-LONG
SPARK PLUG CORPORATION
140 Kansas Street, El Segundo, California

ATTENTION, OWNERS OF 12-VOLT AUTOS. Conventional plugs, designed for 6-volt electrical systems, do not function well in modern 12-volt systems. Life-Long Plugs are designed to handle twice the voltage capacity of 6-volt systems. If your car has a 12-volt system, don't be misled—only Life-Long gives you full plug efficiency!

LIFE-LONG PLUGS ACTUALLY COST LESS! A set of Life-Long Nickel-Cadmium Plugs will outlast six or more sets of ordinary plugs. You end replacement costs completely. Yet the set of 6 Life-Long Plugs costs only $8.95 each. Set of 8 only $11.95.

ORDER REGISTERED SET FOR YOUR CAR NOW. Life-Long Nickel-Cadmium Spark Plugs come to you in a tamper-proof, laminated plastic container. Sealed at the factory, your Life-Long Plugs are not touched until you break the seal.

LIFE-LONG SPARK PLUG CORP., Dept. PS-66
140 Kansas Street, El Segundo, California

Please mail postpaid_____registered sets of Life-Long Nickel-Cadmium Spark Plugs guaranteed to increase my car's mileage, speed and horsepower. (Set of 6, $8.95; set of 8, $11.95.)

Name_____

Street_____

City_____ Zone_____ State_____

Year of Car_____ Model of Car_____

Make of Car_____ No. of Cylinders_____

I enclose ☐ check ☐ cash ☐ money order

DIESEL

MECHANICS IN DEMAND

Learn to earn big pay in DIESEL in our large, modern equipped Chicago school and shop. No previous experience or training necessary. We help you find living quarters and part time job while in school.

Complete, practical courses taught in the following trades, under the supervision of experienced, expert technicians.

APPROVED FOR CIVILIANS ☐ OR GI'S ☐

—CHOOSE YOUR TRADE—

CHECK HERE		WEEKS
☐	DIESEL MECHANICS	20
☐	AUTO MECHANICS	20
☐	BODY & FENDER	16⅔
☐	GAS-ARC WELDING	4-12
☐	REFRIGERATION	13½
☐	AIR CONDITIONING	8⅓
☐	MACHINIST TRADE	30
☐	ADVANCED MACHINIST (includes tool & die)	32½
☐	PIANO TUNING & REPAIR	36

CHOOSE YOUR ENGINEERING COURSE

These courses are intended as terminal education for men who wish to enter the Diesel-Automotive and Refrigeration-Air Conditioning fields as technicians. These courses are designed to prepare men for supervisory positions. Students with a high school education, or equivalent, will be accepted.

☐ DIESEL AUTOMOTIVE ENGINEERING ..... 2 years

☐ REFRIGERATION & AIR COND. ENGINEERING ..... 18 months

FREE EMPLOYMENT HELP

Start your career with Greer by checking your interest above and mail coupon for complete information at no obligation.

NAME _____ AGE _____

STREET _____

TOWN _____ ZONE _____ STATE _____

Established 1902—Over 50,000 Graduates

54 years of continuous trade school experience to guide your training.

GREER SHOP TRAINING

Box F, 2238 S. Michigan Ave.
Chicago 16, Illinois

Need an extra $1,000, $2,000, or more? Make it with an

IDEAL LAWNMOWER SHARPENER

There are thousands of lawnmowers in your locality; Average $1,000 profit per 250 mowers with customer satisfaction and repeat business assured. Provide this essential service with an Ideal® Lawnmower Sharpener, the only machine that grinds the reel to "fit" the bed knife. Compare by any standard. The Ideal, backed by 53 years of experience, costs no more. Write today for complete, free catalog.

The Fate-Root-Heath Company,
Dept. PS-6 Plymouth, Ohio

HYPNOTISM

Be Popular Amaze Entertain

Learn to apply Hypnotism and Autosuggestion in short time by training at home, with GUARANTEED RESULTS—DON'T DELAY. Write to America's oldest, most famous Hypnotic school for free information—now—today. Sent in plain wrapper.

SCHOOL OF APPLIED HYPNOLOGY

Dept. 26 120 Central Park South N. Y. 19, N. Y.

GIANT FREE CATALOG of OPTICAL BARGAINS

ASTRONOMICAL TELESCOPE HEADQUARTERS

Complete Line of Astronomical Telescope Parts and Assembled Telescopes. Also huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, binoculars, etc. Fresnell Lenses for making solar Furnace. **SEND ONLY $1.00** for beginner's 10-lens kit and big instruction booklet Stock 2-N. Ask for FREE catalog N

EDMUND SCIENTIFIC CORP., Barrington, N.J., U.S.A.

LEARN METALCRAFT and JEWELRY MAKING

Low Cost Home Training Now Available

Make money. Learn profitable skills and arts of decorative metal and jewelry crafts. Course is complete. Professionally prepared. Easy to master. Special tools and materials furnished.

Write for Free Booklet **INTERSTATE TRAINING SERVICE**
DEPT. K-2 PORTLAND 13, OREGON

Own and Play the ACCORDION

for fun...for popularity...for profit!

SAVE UP TO 50% on famous ITALIAN MAKES

Buy direct at amazing savings from America's biggest importer of fine Italian made accordions. **5 DAY FREE TRIAL!** Easy Terms. Free Lessons—Easy to learn. Personalized selection service. Trade-ins accepted. Write today for big Color Catalog and our low wholesale prices. FREE!

5 DAY FREE TRIAL

Accordion Manufacturers & Wholesalers Outlet
2003 West Chicago Avenue - Dept. P-66 - Chicago 22, Illinois

NEW FALSE PLATE FROM YOUR OLD ONE IN 18 HOURS

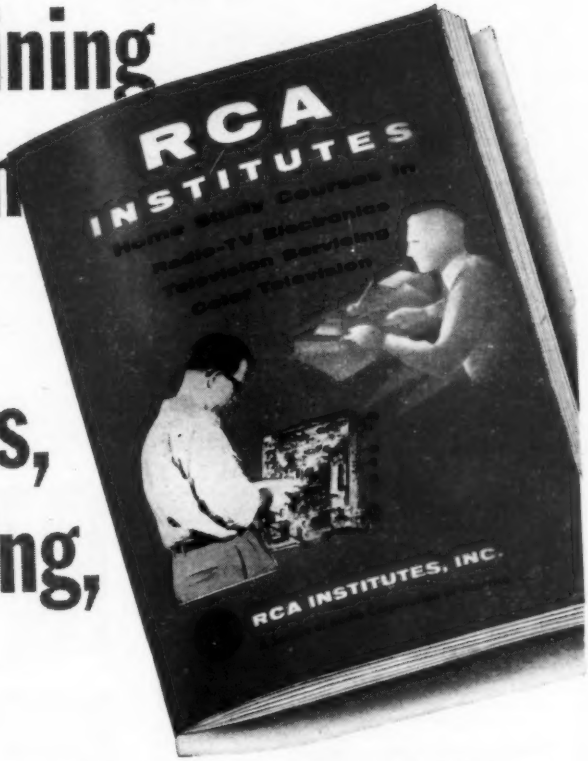
AS LOW AS $14.95

Send us your old broken, cracked or loose plates and we'll transform them into new lightweight wonder plastic plates. NO IMPRESSIONS needed with our revolutionary method. We use your own old plates. We remake them completely in only 18 hours. Missing teeth carefully matched and replaced. We GUARANTEE TO SATISFY YOU OR REFUND YOUR MONEY.

SEND NO MONEY—Send us your name today and we'll RUSH COMPLETE DETAILS. Begin to enjoy life right now. Clip this Ad; save it and send for free facts.

CHICAGO DENTAL PLATE LABORATORY • Dept. PS-656
30 N. Dearborn St. • Suite 807 • Chicago 2, Ill.

RCA offers you the finest training at home in Radio–TV electronics, TV servicing, Color TV



SEND FOR THIS FREE BOOK NOW!

The instruction you receive and equipment you get (and keep) will start you on your way. Pay-as-you-learn. You pay for only one study group at a time. This 52 page book contains complete information on Home Study Courses for the beginner and the advanced student.

RCA INSTITUTES, INC.
A SERVICE OF RADIO CORPORATION of AMERICA
350 WEST FOURTH STREET, NEW YORK 14, N.Y.

RCA Institutes, Inc., Home Study PS66
350 West Fourth Street New York 14, N. Y.
Without obligation, send me FREE CATALOG on Home Study Courses in Radio, Television and Color TV. No salesman will call.

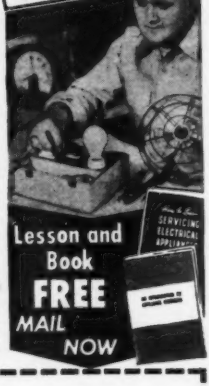
Name.....
Please Print
Address.....
City.....Zone.....State.....

IMPORTANT
Be sure to write for RCA Institutes catalog before signing up for any Radio-TV course

Step Up Your Pay — Learn to Fix APPLIANCES

ACT NOW-Fast Growing Field Needs More Electric Appliance Technicians

AT HOME IN SPARE TIME



Electrical appliance repair offers you good pay, SECURITY. Every wired home today averages 8 electrical appliances. Up to 10 million new appliances are sold every year. Owners pay well to keep them in repair. That means a fast growing need for trained men.

Learn with Tester You Build

Our training includes the parts to build a multi-use appliance tester that helps you find electrical defects easily. It equips you to do professional trouble-shooting; helps you start making money soon after you enroll.

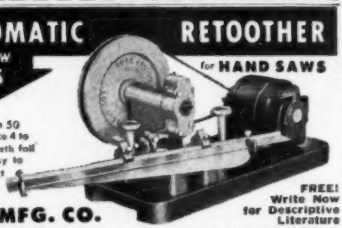
Earn $3, $4, $5 Hour Spare Time

Fix toasters, irons, fans, etc. for friends and neighbors in spare time. Jobs done in basement or spare room can earn you $3 to $5 an hour. Mail coupon today.

NATIONAL RADIO INSTITUTE
Dept. BF6, Washington 9, D.C.
Please send me Electrical Appliance Training lesson and book free. (No salesman will call.)
Name.....Age.....
Address.....
City.....Zone....State.....
Member National Home Study Council

AUTOMATIC RETOOTHER for HAND SAWS

MAKES NEW PROFITS



Cuts new teeth in 50 seconds — any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job

FREE! Write Now for Descriptive Literature

BURR MFG. CO.
8943-Z VENICE BLVD. LOS ANGELES 34, CALIFORNIA

see for yourself!

Capra Gems

more dazzling than diamonds at 1/30 the cost!

FREE Booklet

Get full facts, FREE, on the most amazing discovery by modern science—CAPRA GEMS. *A miracle of science described in recent issues of Saturday Evening Post and Reader's Digest.* They're more dazzling than diamonds, yet cost much less. CAPRA GEMS' refractive quality is actually higher than diamonds! Brilliantly beautiful, dazzling CAPRA GEMS are hand cut, hand polished and hand selected . . . priced within the reach of all who love fine gems. A 1-carat diamond stone costs you approximately $1000. A comparable choice selected, 1-carat CAPRA GEM is yours for $24, federal tax included . . . and can be bought in small easy payments.

GET THE FACTS NOW

Valuable illustrated booklet shows a wide selection of men's and women's rings. Gives full details, including prices and settings . . . shows all CAPRA GEMS actual size. Limited supply, so send today without delay. No charge, no obligation. Get all the facts on CAPRA GEMS . . . more dazzling than diamonds.

SEND NO MONEY

CAPRA GEMS, Co., Dept. PS-66, P. O. 5145, Philadelphia 41, Pa.

SHORTHAND IN 6 WEEKS

Write 120 words per minute
Age no obstacle—LOWEST COST

Famous SPEEDWRITING shorthand. No symbols; no machines; uses ABC's. Easiest to learn and use. Fast preparation for a better position. Nationally used in leading offices and Civil Service. 120 words per minute—50% FASTER than Civil Service requirements. Over 350,000 taught by mail or through classroom instruction. The very low cost will surprise you. Typing available. 33rd Year. Schools in over 400 cities in U.S., Canada, Cuba, and Hawaii.

DID YOU SEE READER'S DIGEST ARTICLE ON

Write For Free Booklet To: School of

Speedwriting

Dept. 2606-6, 55 W. 42 St., N. Y. 36 ®

SELF CHARGING TRANSISTORIZED
GEIGER COUNTER

only $19.95 ppd.

Includes • Holster • Radioactive Source • Uranium Official Yearbook (Reg. $2.00) • Crystal Headphones

New! Revolutionary, reliable! Sensitive to gamma rays from all radioactive ores. Guaranteed. Free Literature, or send for Uranium Official Yearbook plus radioactive source....both for $1.50

Send check or m.o. (postage extra on C.O.D.'s)

WESTWOOD RESEARCH & DEVELOPMENT LABORATORIES, INC.
14945 Ventura Blvd., Dept. A, Sherman Oaks, California

$7.95

DRAINS cellars, cisterns, wash tubs
IRRIGATES - CIRCULATES - SPRAYS

1,001 USES—HOUSE, GARDEN, FARM

Original All-Purpose Pump has 3,000 GPH capacity, 450 GPH 80' high; or 1800 GPH from 25' well. Use any 1/6 to ¾ HP motor. Stainless steel shaft. Oil-less bearing. 1" inlet; ¾" outlet. Motor coupling included.

DOES NOT CLOG OR RUST

Postpaid if cash with order. Send for yours today! MONEY BACK GUARANTEE. Larger Centrifugal Pumps and Gear Pumps in all sizes.

LABAWCO PUMPS, Belle Mead 3, N. J.

. . . Swiss or American

Unique Sweazy System starts you making repairs right away. Develops your skill step-by-step. Teaches modern methods... professional short cuts. Learn by personal attendance or spare time home study. Approved for veterans. Free Sample Lesson. No obligation. Write today!

CHICAGO SCHOOL OF WATCHMAKING
2330 Milwaukee, Dept. 466, Chicago 47, Ill.

IF YOU "EAT, SLEEP & LIVE" CARS—LEARN HIGH-PAY

AUTO MECHANICS & Diesel!

DON'T LOSE OUT—FIND OUT! *At Home in Spare Time* prepare for profitable Mechanic work, or own Business! Easy to learn by our Shop-Method Training. Low tuition. TOOL SET included. Earn as you Learn. Age and education no barrier! Rush coupon for FREE BOOK AND LESSON!

OK FOR VETS

MAIL NOW TO OFFICE NEAREST YOU!
(mail in envelope or paste on postal card)

NATIONAL SCHOOLS, Dept. DC66
4000 SO. FIGUEROA STREET, LOS ANGELES 37, CALIF. OR 187 N. LA SALLE ST., CHICAGO 1, ILL.

Rush free Auto Mechanics Book & Lesson! No obligation!

NAME_____ BIRTHDAY____19__
ADDRESS_____
CITY_____ZONE____STATE_____

NOW YOURS A NEW DYNASCOPE REFLECTOR

A Superior-Performing Professional-Model Telescope

with BAKELITE TUBE and TWO (50X & 100X) EYEPIECES

ALSO PORTABLE TRIPOD AND COMBINATION NON-FRICTION EQUATORIAL & ALT-AZIMUTH MOUNT!

SEE JUST WHAT YOU GET

1- 3" **MIRROR**, f 12.5, aluminized and overcoated, guaranteed to resolve to Dawes' limit for its size.

2- 36" **BAKELITE TUBE.**

3- 2 **EYEPIECES**—50X & 100X Ramsdens.

4- **CAST-IRON MOUNT.** Combination Non-Friction Equatorial & Alt-azimuth.

5- 33" **TRIPOD** of finished hardwood.

- **MIRROR CELL**—Removable—Ventilated.
- Open end & eyepiece covers.
- Factory tested to "split" 2 seconds of arc separation; also Focault, Ronchi and final definition tests.
- A portable, completely assembled tested-quality instrument ready for immediate precision performance.

Other Accessories at Small Extra Cost —On Request

COMPLETE ONLY $27.95

F. O. B. Hartford, Conn. Shipping Wt. 9 lbs. Express Charges Collect

Yes, it's really true! The latest scientifically correct reflector telescope with *all essential professional features*—A triumph of three years of painstaking tests and experiments for higher power, clearer definition and more durable service at lowest possible price! Never before anything like this new *DYNASCOPE* Reflector! A proud addition to Criterion's famous family of highest standard Dynascopes. Just match it against any other scope at $35 or even $40—for these *professional capabilities and advanced precision features:*

PROFESSIONAL CAPABILITIES! Guaranteed observatory clearness! Perfect portability! Prolonged trouble-free performance! *Automatically* follows the stars in their courses! In actual *controlled* tests, the new Dynascope out performs scopes of much, much higher cost, and larger diameter! Resolves most difficult celestial objects, Hundreds of Mountains & Valleys on the Moon, Red Face of Mars, Moons of Jupiter, Rings of Saturn, Star Clusters, in fact the finest double Stars.

ADVANCED PRECISION FEATURES! The MIRROR: 3-inch Newtonian Reflector, f 12.5, aluminized and overcoated, finished to exacting specifications and *guaranteed to perform to the Dawes' limit* for size of instrument! The TUBE-36-inch BAKELITE, the strongest, finest insulator known—not subject to mercy of atmospheric changes! The EYEPIECE—not one but TWO *Ramsdens*—for 50 power and 100 power—both standard equipment! Also Cast Iron smooth-operating combination non-friction Equatorial and alt-azimuth mount specially constructed to guarantee perfect performance on this Dynascope—the very same as on fine instruments formerly sold at $44.95.

WE'LL BACK IT TO THE LIMIT! Here's your Unconditional Money Back Guarantee: You'll be more than satisfied, you'll be thrilled! You'll agree with the professionals: The Dynascope Reflector is the most flawless instrument made for its size! Ideal for serious amateurs, classrooms, and as a second portable instrument for professional astronomers! You'll agree too, with leading planetaria and hundreds of individual users who are on record praising Dynascope's incredibly superior performance and durability! You'll be as proud to own the new Dynascope as we are to offer it to you! Immediate shipment. Send check or money order today!

THE CRITERION MANUFACTURING COMPANY
Dept. PSD3, 331 Church Street
Hartford, Conn.

A "GOOD HAND" HELPS YOU SUCCEED!

LEARN TO WRITE WELL

Your Name beautifully written, plus special pen-point for shaded writing. *Only 10¢*

SINCE 1895

Handwriting quickly improves with our easy-to-understand picture lessons! Put your spare time to good use; send today for ☐ FREE BOOKLET of Penmanship Courses and Supplies or check volumes wanted below at $1 each: ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Bird & Design Flourishing ☐ Engrossing Alphabets. COMPLETE SET $4.50. Act now!

TAMBLYN SCHOOL of PENMANSHIP
S. A. Ziller, Pres. 438 Ridge Bldg., Kansas City, Mo., USA

CABINET MAKING

LOW COST HOME TRAINING COURSE FOR BEGINNERS & ADVANCED CRAFTSMEN

Make money. Learn skills and secrets of fine woodworking and tool use. Professionally prepared shop method training tells and shows how. Covers everything. Easy to master.

Write for Free Booklet

INTERSTATE TRAINING SERVICE
DEPT. F-2, PORTLAND 13, OREGON

---

only $95 freight incl. Write For FREE FOLDER

12 ft. SPORTBOAT KIT

Includes ready-cut parts and hardware. Models low as $39.00 freight incl.

TAFT MARINE WOODCRAFT
Dept. PS-6, 636 39th Ave. N.E., Minneapolis 21, Minn.

GUNS

AUTHENTIC REPLICAS

Reproduced in Actual Size, Design and Balance. Made of Solid Cast Aluminum. Finished in Gun-metal Black.

S & W .38 Police Special

START COLLECTING NOW!

- ☐ German P-38
- ☐ Colt Cobra .38
- ☐ German Luger
- ☐ German Mauser
- ☐ Spanish Moxley
- ☐ Russian Tokarev
- ☐ Italian Brevettata
- ☐ Japanese Nambu
- ☐ Frontier .44 Colt
- ☐ Belgium Automatic
- ☐ Colt .45 Automatic
- ☐ Czechoslovakian Pistol
- ☐ S & W .38 Police Special

3.00 EACH POSTPAID
Folder 10¢

Send Cash, Check or Money Order

No COD's
No Canada Orders

LYTLE NOVELTY CO.
2656-56 Fashion Avenue
Long Beach 10, California

EYE GLASSES by MAIL As low as $1.95

WRITE for FREE CATALOG with 14 LENS SAMPLE CARD

• Thousands of Customers

Est. 1929

QUALITY READING-MAGNIFYING OR BIFOCAL GLASSES FOR FAR AND NEAR

ADVANCE SPECTACLE COMPANY, Inc.
537 S. Dearborn St., Dept. SP-6 Chicago 5, Illinois

EVEN IF YOU DON'T KNOW A NOTE OF MUSIC NOW...

YOU CAN LEARN YOUR FAVORITE INSTRUMENT THIS EASY A-B-C WAY

No special "talent," no previous training needed. This U. S. School home-study method is so successful because you learn to play by playing real tunes by note, right from the start. And just think, you can learn your favorite instrument for only a few cents a day!

If interested, mail coupon for FREE 36-page Book showing how easy it is to learn any instrument, right at home, in spare time, without a private teacher. No obligation; no salesman will call on you. **U.S. SCHOOL OF MUSIC, Dept. 156, Port Washington, New York. (58th Year)**

U. S. SCHOOL OF MUSIC,
Dept. 156, Port Washington, N. Y.

Please send me your 36-page illustrated Free Book. I would like to play (Name Instrument):

Instrument _____ Have you Instrument? _____

Name _____
(Please Print)

Address _____

ENGINEERING

Photo of Heald Electrical Laboratory

Thousands of Engineers Needed for Hard Pressed Industry

BACHELOR OF SCIENCE DEGREE, 27 MONTHS

Degree Courses:
- ☐ Electronic Engineering
- ☐ Electrical Engineering
- ☐ Highway Engineering
- ☐ Mechanical Engineering
- ☐ Structural Engineering
- ☐ Civil Engineering
- ☐ Architecture

Diploma Courses:
- ☐ TELEVISION
- ☐ Tool & Die Design
- ☐ Architectural Drafting
- ☐ Mechanical Drafting
- ☐ Structural Drafting
- ☐ Surveying
- ☐ Estimating
- ☐ Master Electrician

Enroll Now for New Term

Heald College Ranks FIRST West of the Mississippi in "Who's Who" in America

Send for FREE Information

Heald Engineering College
Van Ness at Post, Dept. P86
San Francisco, California

Approved for Veterans

NAME _____
STREET _____
CITY _____
STATE _____

AMAZING NEW PERSONAL POCKET RADIO

LISTEN WHILE YOU WALK DOWN THE STREET!

Slips in any pocket—wt. only 7 ozs. Size 2¾"x4¾"x1¼". Beautiful Black Gold Plastic Case. NO HOOKUPS—NO WIRES—NO PLUG-INS! Self-contained. 150-hour life flashlight batteries and BUILT-IN ANTENNA. POSITIVELY NO AERIAL HOOK-UPS EVER! GUARANTEED RECEPTION OF RADIO STATIONS TO 50 MILES up to 1500 miles for powerful stations! New patented Super-regenerative Duotriode tube and transformer audio stage for sharp selectivity and sensitivity! Easy to use top tuner (while walking). Tiny, plastic personal ear plug LETS YOU ALONE LISTEN WHILE YOU WALK, VISIT, WORK, RIDE OR SLEEP ANYTIME – ANYWHERE. MONEY-BACK GUARANTEE AND ONE YEAR SERVICE GUARANTEE.

SEND ONLY $5.00 (ck, mo) and pay postman $14.95 plus postage on delivery or send $19.95 for postpaid delivery. GET YOUR TINYTONE REAL POCKET RADIO now and be ready to listen to **Civil Defense Alarms, news, music, sports, etc., on a moment's notice without bothering those around you.** NOT AN UNWORKABLE, INCOMPLETE KIT OR PLAYTHING, BUT A REAL POCKET RADIO! Shipped complete with batteries—Ready to listen! Available only from: **WESTERN RADIO, Dept. APS-6, Kearney, Nebr.**

LEARN LOCKSMITHING

Send for **FREE BOOKLET**

Learn this fascinating, profitable trade from experts in your spare time at home! Age or physical handicap no disadvantage. **Year around, steady income. Full or part time.** Practical, illustrated lessons. You can make money even while learning! All materials and special tools supplied without extra charge.

LOCKSMITHING INSTITUTE, Dept. PS-78
15 PARK AVENUE RUTHERFORD, N. J.
Lic. by N. J. State Board of Education
Approved for Veterans

Find HIDDEN TREASURES

GOLD, SILVER, PRECIOUS METALS with the Famous Model 27 Metal Detector. Lightweight, ultra-sensitive, low cost. None finer. Also GEIGER COUNTERS for uranium and the VIOLITE for tungsten. INFORMATION FREE

THE *Detectron* CORP.
5528 Vineland Ave., No. Hollywood, Calif.

HE-MAN VOICE!

STRENGTHEN *your* voice this tested *scientific* way. Yes—you may now be able to improve the POWER of your speaking and singing voice... in the privacy of your own room! Self-training lessons, mostly silent. No music required.

FREE BOOK Write TODAY for Eugene Feuchtinger's great booklet "How to Develop a Successful Voice." It's absolutely FREE! You must state your age. Booklet mailed postpaid in plain wrapper. No salesman will call. Send your name and age RIGHT NOW! **Prefect Voice Institute, 210 S. Clinton St., Studio FU-1, Chicago 6, Ill.**

MAIL ORDER OPPORTUNITY

Exciting home business—or office sideline. Mail order executive will show you how to net large profits with no investment in merchandise or advertising required. Experience not necessary. Proven practical—fully explained in FREE confidential letter. Write: IMPACT, 2108 Payne, Dept. 16-6, Cleveland 14, Ohio.

"WE'RE LOOKING FOR PEOPLE WHO LIKE TO DRAW" ... says Norman Rockwell, one of America's 12 Most Famous Artists. If you like to draw, you may have talent to become a successful artist, spare or full time. Find out for sure with our scientific, 8-page **Free Art Talent Test.** Thousands paid $1 to take it. Get it FREE. No obligation. Send your name, address, age to: Famous Artists Schools, Dept. 11-F, Westport, Conn.

FREE FACTORY-TESTED TUBE
22 YEARS AT THIS ADDRESS

Guarantees are as reliable as the company giving them. Our Guarantee accepted by the Public with satisfaction for 22 Years. "The Most Protection for the Least Money."

PARTIALLY USED. CHECK MY GUARANTEE & PRICES! FOOLISH TO PAY MORE—DANGEROUS TO PAY LESS NOT RECAPS 12 MOS. WRITTEN GUARANTEE.

SPECIALISTS IN TRUCK TIRES—
Selected for Toughest Jobs—Tops in Value

600x16	$5.15	475x19	$5.35	700x15(6)	$7.75	700x20	$8.85
600x16(6)	5.55	640x15	4.75	750x16(8)	10.65	750x20(8)	9.75
650x16	5.55	670x15	5.05	700x17	10.65	750x20(10)	15.65
650x16(6)	6.35	710x15	5.25	750x17	10.85	825x20	17.95
700x16	5.65	760x15	5.25	750x15	10.85	900x20	18.95
750x16(6)	7.45	800x15	5.55	600x20	10.65	1000x20	19.25
550x17	4.65	820x15	5.55	650x20	10.95	1100x20	19.25
650x15	5.15	550x15	5.25	32x6(8)	10.75	1000x22	20.25
700x15	4.85	700x16(6)	8.25	32x6(10)	12.65	1100x22	20.25

Whitewalls $1.00 extra.

"EXTRA SPECIAL" Fully Guaranteed all size 4-ply pass. FREE TIRE with 2 or more of these.—W. W. $1.00 Extra Factory Tested Tube given. GIANT TIRE SALE. Previously $10.00 Values Shaved to the Bone on Price—The Same Hi-Grade Tires You See Advertised Elsewhere at Higher Prices—send this ad— $7.65

Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. S. No C.O.D.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

NEW HELP FOR PASSING PROFESSIONAL ENGINEER LICENSE EXAMS

New book contains over 500 questions and answers of type used in engineer's licensing examinations all over the country. Shows exactly the kind of questions asked; reveals areas where you can improve your knowledge before you go in the examination room. Covers mechanical, electrical, civil, and chemical engineering; includes engineering economics and land surveying. For every question, gives detailed answer of the type examiners accept and credit. Written by an authority, widely experienced in preparing actual examinations. Use the book 10 days FREE, then remit $6.50 or return it to us. Write now for Lalonde's **Professional Engineer's Examination Questions & Answers** to McGraw-Hill Book Co., Dep't PS-6, 327 W. 41st Street, New York 36, N.Y.

UPHOLSTERY
BE YOUR OWN BOSS

Practical, low-cost, LEARN-BY-DOING UTS Course, complete with tools, materials, frames, trains you quickly AT HOME in spare time. Start making money in Upholstery almost at once! Big **FREE** illustrated book and **FREE** sample lesson show you how—give full facts about business, job opportunities for men and women. Write TODAY! Also Resident Training. Approved for Vets.

UPHOLSTERY TRADES SCHOOL
Dept. EH-1609 721 Broadway, New York 3, N.Y.

TELEVISION NEEDS TRAINED MEN

Train AT HOME for a top-pay job or your own business. No experience needed. "Learn by doing" with 15 big radio-TV kits, including TV receiver. Licensed by N. Y. State; Approved for Veterans. Write for FREE BOOK & SAMPLE LESSON.

RADIO-TELEVISION TRAINING ASSOCIATION
Dept. P-6C 52 E. 19th St. New York 3, N. Y.

DOLLARS for 18¢?

Yes, buy U. S. $1.00 values for 18¢ abroad. Get new, big profit mail order plan proved by 100,000 cash orders shipped from overseas. You carry no stock. Full or part time—even from home. Export and travel abroad opportunities too. Details with bargain import examples **FREE.** *Write* MELLINGER CO. Dept. F246 1717 Westwood, Los Angeles 24, Calif.

RUPTURED
BE *FREE* FROM TRUSS SLAVERY

NOW there is a new modern **Non-Surgical** treatment that permanently corrects rupture. These **Non-Surgical** treatments are so certain, that a Lifetime Certificate of Assurance is given. Write today for our New FREE Book that gives facts that may save you painful and expensive surgery, and tells **how non-surgically** you may again work, live, play and love and enjoy life in the manner you desire. There is no obligation.
Excelsior Hernia Clinic Dept. 3705 Excelsior Springs, Mo.

BARGAINS

IS THE ONLY BIG TABLOID PUBLICATION in Existence That Tells You WHERE & HOW

— EVERY MONTH —

- **To Buy Bankrupt, Closeout, Surplus Bargains!**
- **To Buy Items at Wholesale!**
- **At Below Wholesale!**
- **To Buy New & Unusual Items!**
- **Information on Rare Money Making Offers!**

TOYS, BOOKS, JEWELRY, GREETING CARDS, COSMETICS, HOUSEHOLD MERCHANDISE, APPLIANCES, INDUSTRIAL MATERIALS, MACHINERY, TOOLS, ETC.

Often Low as 10c-25c on the Retail Dollar!!

ONE issue of this Sensational NEW publication can save you MORE MONEY than the cost of the entire subscription! BUY BETTER, CHEAPER, NEWER THINGS EVERY MONTH OF THE YEAR! Each issue carries HUNDREDS of bargain offers . . . many times SO EXTRAORDINARY that it's hard to believe that they're GENUINE! Buying at WHOLESALE, BANKRUPT, SURPLUS, CLOSEOUT PRICES can save you from 40c to 80c or more on every dollar you spend! THIS MAY BE HARD TO BELIEVE, BUT IT IS THE TRUTH!

BUY CHEAP—SELL CHEAP! Thousands of smart salesmen, dealers subscribe because they want to know where to buy cheap in order to sell cheap & make big profits! Why can't you do the same?

Few samples of the bargains usually found in "Bargains":

- Pencils, 57½¢ gross
- $1 Mufflers, scarfs, 12½¢
- 1000 razor blades, $1.50
- $2.50 wallets, 30¢ each!
- $1 val billfolds, 15¢
- CIGARETTE HOLDERS, 1¢
- New phono records, 7¢ ea.
- Calendar wrist watches, $5.
- 69¢ insect repellent, 5¢ each
- 20" TV pic. tubes, $21.95
- $1-3 hard cover books, 10¢
- $200 typewriters, $23.00
- 50¢ Everyday cards, 7¢ bx.
- $1.95 Men's silk ties, 12½¢
- $1 Card shufflers, 9¢ ea.
- $10 Toiletry sets, 60¢

PLUS MANY MANY OTHERS! (List above merely illustrates type Bargains usually found every month. This changes monthly.)

Subscribers Shopping Service. Lets you buy single items at LOW, LOW wholesale prices which "Bargains" negotiates strictly for its subscribers!

Only Publication Of Its Kind In Existence! No other publication like it! Available by subscription only!

LOOK WHAT SUBSCRIBERS SAY!

" . . received my 1st issue and may I say it is a GREAT magazine."—M. C. Ark.

" . . I am very pleased with "Bargains." I have never seen anything like it."—Mrs. D. M. Me.

" . . just received my 1st copy and believe me, it is all that you claimed it to be."—T. A. N.Y.

PLUS MANY, MANY OTHER UNSOLICITED LETTERS!

Big 1956 Christmas Special Issues. You'll automatically get it if you subscribe. Jammed full of terrific Xmas buys!

12 Big Issues For Just $2.00

(Reg. price, $3 per year. Spec. Limited time offer.)

Your Money Back In Full If The First Issue That You Receive Doesn't Please You!

(No Quibbling about it, either!)

Your Money Back IN FULL if the First Issue Doesn't Please You!

TOWER PRESS, INC., P.O. Box 591-ZX Lynn, Mass.

"Tear out Coupon. Mail NOW—at once!"

Tower Press, Inc., Box 591-ZX, Lynn, Mass.

O.K. Here's my $2.00 for 1 year subscription. Rush me 1st copy!

Name . . . . . .

Address . . . . . .

City . . . . . State . . . . . .

Remember! Your Money Back in FULL if the 1st issue you receive doesn't please you!

Cleveland Engineering Institute
DEPT. PS6P
6300 Euclid Ave., Cleveland 3, Ohio
☐ Mechanical ☐ Aeronautical

NAME.....AGE.....
ADDRESS.....
CITY..... STATE.....
No Obligation — No Salesmen

DRAFTING DOUBLES YOUR INCOME

IT'S EASY — AT HOME — IN YOUR SPARE TIME — PAY AS YOU LEARN

MECHANICAL OR AERONAUTICAL

In a few months . . . earn big pay . . . assure your future! There's a record demand for draftsmen! Keep your job, yet prepare for a better one.

No experience needed — C. E. I.'s Professional Engineers train you at home. Do as hundreds of our other graduates have done — let a C. E. I diploma pave the way!

RESIDENT and HOME STUDY COURSES

FREE SUCCESS BOOK SAMPLE LESSON

Completed your course and was made Shop Foreman with a 50% increase in salary. W. R.

After completing your course my salary increased from $350 to $820 per month. G. T. W.

Was promoted ahead of four other men with a pay increase after completing your course. W. K. A.

APPROVED FOR VETERANS

50 HOURS EXTRA TRAINING AT OUR RESIDENT SCHOOL NO EXTRA CHARGE

CLEVELAND ENGINEERING INSTITUTE
6300 EUCLID • CLEVELAND 3, OHIO

TASOPE PHOTO-ENGRAVING PLANTS

MATERIAL COST OF THIS CUT 1½¢ SELLING PRICE $1.00 AND UP

Establish your own profitable PHOTO-ENGRAVING business. Make cuts for newspapers, printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for FREE catalog.

TASOPE, DEPT. PS-6, AURORA, MO.

STUDY INDUSTRIAL DESIGN

You can train at Art Center School in California with practicing-professionals for upper-level jobs in INDUSTRIAL DESIGN. Recent graduates have been added to the staff at General Motors, Chrysler, Raymond Loewy, Henry Dreyfuss, etc. Majors in transportation, general product design, structure, community development, packaging, display. 4-year degree course. Learn to combine imaginative design with technical proficiency, coordinate utility and beauty. Stimulating environment. Field trips. Advantages of mild Southern California climate and nearby holiday spots. Accredited. Coed. Placement service. Established 25 years. New terms February, June, September. Catalog.

ART CENTER SCHOOL, Edward J. Adams, Director
5353 WEST THIRD STREET LOS ANGELES 5, CALIFORNIA

PREPARE FOR BETTER JOB, BIGGER PAY IN SPARE TIME AT HOME

Today, choose the job you want—and prepare for it in time you might otherwise waste. Or if you are already in the work you like best, start training now for quicker promotion and increased pay. During more than 50 years AMERICAN SCHOOL has helped ambitious people to reach higher goals. Check subject that interests you and mail coupon for full information.

AMERICAN SCHOOL, Dept. GA46, Drexel at 58th, Chicago 37, Ill.

Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

☐ Accounting
☐ Apprenticeship Courses
☐ Architecture & Building
☐ Automotive Technician
☐ Better Foremanship
☐ Bookkeeping
☐ Business Management
☐ Civil Engineering
☐ Contracting
☐ Diesel Technician
☐ Drafting—Building Trades
☐ Drafting—Machine Trades
☐ Electrical Engineering
☐ Electricity—Practical
☐ Electronics—Industrial
☐ HIGH SCHOOL COURSES
☐ Mechanical Engineering
☐ Mechanical Technology
☐ Metalworking Courses
☐ Plumbing—Practical
☐ Private Secretary
☐ Retail Merchandising
☐ Salesmanship—Outside
☐ Sheet Metal Work
☐ Tool Making

NAME.....OCCUPATION.....
HOME ADDRESS.....AGE.....
CITY.....STATE.....
Conditions: Write American School, Dept. GA46, 1610 Sherbrooke St. W., Montreal

MAIL COUPON NOW

See Dan on TV "Big Top" Show

BUY DIRECT SAVE $

Save 60% on FAMOUS "TV-BIG TOP"

DAN LURIE BARBELLS

FREE—60 muscle building courses—68 photos with your order

50 lb. set $8.48 150 lb. set $20.48
100 lb. set $13.98 200 lb. set $25.98

Send for free catalog

Order by mail—50% with order. Balance C.O.D. Extra wts. 13c lb. FOB Plant.

DAN LURIE BARBELL CO.
52-S6 Bristol St., Dept. 670-F, Brooklyn 12, N. Y.

Let Strongman Dan Make You A Man
Results guaranteed or money back

make your own Gems 29.50 F.O.B.

The Gem Maker comes complete with all necessary equipment, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only $29.50, f.o.b. Burlington, Wisconsin. Write today for information and literature.

B & I MANUFACTURING CO.
Dept. S Burlington, Wis.

NOW! YOU CAN TEST YOUR OWN TV AND RADIO TUBES

All of Them—even picture tube! It's easy and safe with this A. B. C. Tester. Simply insert tube in socket. Pilot light instantly indicates if tube needs replacement. A precision instrument. Rugged metal case (not plastic). Operates on AC or DC. One service call saved pays for tester. Only $3.95 postpaid (DeLuxe model $4.95) or C.O.D. plus charges. Instructions included. 5 Year Guarantee.

OMEGA ELECTRONICS, Dept. T-184, 4700 W. Washington Blvd., Chicago, Ill.

RUPTURE

RELIEF...OR YOUR MONEY BACK

Write now for free booklet and pictures of rupture care. You can be helped...work steady, with low cost, easy to wear Web Truss, thousands satisfied.

WEB TRUSS CO. Dept. PS-6, Hagerstown, Maryland

TELEPHONES

Desk Stand Style

Slightly used but in excellent condition

Many Valuable Uses

Inter-House Phones House In Barn, etc.
Loud Speakers Microphones
Educational Purposes, Toys, etc.

Comes complete, ready to use with wiring diagrams included. Two complete for only $5.00

$2.75 Postpaid in U.S.A.

TELEPHONE LAMP KIT—with illustrated instructions for making Desk Telephone Lamp including all parts (harp, nipples, push switch, cord, plug, etc.) . . . . $6.50 Ppd. (Shade is not included).

MICROPHONE, Dept. X-3584, 1760 W. Lunt Ave., Chicago 26, Ill.

"How to Go into Business for YOURSELF"

BOTH FREE!
Rush Name on Postcard Today!

If you know a trade or occupation—why not go into business for yourself? Why not make the profits others are now making?

IT'S EASY TO START A NEW BUSINESS. It's easier than you think—once you learn the 9 easy steps of building a new business of your own. National Business Consultants has shown over 5000 others how to be successful—let us show YOU too. We guide you every step of the way with sound, proved simple business practices. **EXPAND YOUR OWN BUSINESS.** Learn our tested, profit-making methods for business success. If you already own a business, let N.B.C. guide you too. You'll be amazed. **SEND FOR FREE BOOKLET TODAY!** "How to Start a Business" is jam-packed with revealing information. In easy-to-understand language it explains how to start and make any kind of business profitable. Free for the asking! Sent to you in confidential plain envelope. *Just write:*
NATIONAL BUSINESS CONSULTANTS, Office A-6 Los Angeles 61, Calif.

BECOME AN EXPERT IN TRAFFIC *and* TRANSPORTATION

Traffic men earn $4,000 to $10,000 and up. Thousands of firms need experts on rates, tariffs, regulations. We train you thoroly in spare time at home for executive traffic jobs. Personal training under traffic authorities. Write for free book "Traffic and Transportation."
LASALLE Extension University, 417 So. Dearborn St.
A Correspondence Institution Dept. 683T Chicago 5, Ill.

CASTING SECRETS REVEALED!

Now you can learn how to make big money by casting thousands of perfect plaques, book ends, figurines, etc., with X.L. rubber molds.
NO EXPERIENCE. VERY LITTLE CAPITAL NEEDED
X.L., Rubber, Pts. $2.50; Qts. $4.00 (postage extra). Molds and enough rubber for three molds, $1.50 prepaid. U.S. only. Send 25c (refunded with order) for informative catalog (40 pages) describing this wonderful, exciting *Profit-making* business.

HUGE PROFITS! MORE MONEY!

PLASTIC ARTS STUDIO 3403 S. MADISON, DEPT. 3 MUNCIE, INDIANA

LEARN ASTRONOMY THE EASY WAY

Setting circles and mounting with tripod makes locating stars, planets and constellations easy. Setting circles made of ½" plywood 6" in diameter coated with table top lacquer. Mounting made of reinforced hard plywood and solid hard wood. Locator stick can be replaced with telescope. Complete star locator **$16.00** includes postage. Setting circles set **$4.00** Instructions incl. Write for circular on brass and aluminum circles and cast iron laps.

O. MAGNUSSON
14560 W. 52nd Ave. Arvada, Colo.

GIANT STAMP ZOO FREE!

Snakes, Leopards, Rhinoceros, Zabu, Koalabear and other fierce jungle beasts, Approvals. Send 10c for handling. FREE STAMP MAGAZINE.
LINCOLN STAMP COMPANY,
St. Catharines 551, Ont., Canada

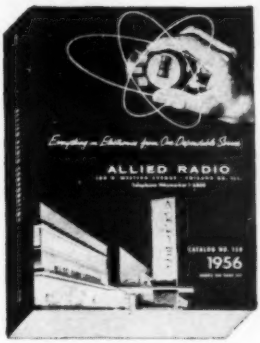
ELECTROPLATE METAL AND NON-METAL OBJECTS YOURSELF

GOLD — CHROME — COPPER — NICKEL

Give new sparkle to objects in home or garage with miraculous new plating kit. Make extra money in your spare time. Simple to electroplate anything . . . tools, auto parts, jewelry, etc. Write today for complete kit and instructions. SEND NO MONEY. Pay postman just $5.95 plus C.O.D. on money back guarantee if not satisfied. Or send remittance and we pay postage. Write:

RAPID PLATERS Dept. 339 1813 S. Clinton St. CHICAGO 16, ILL.

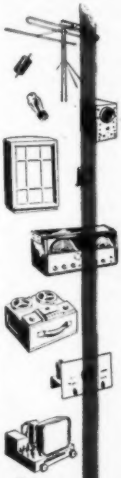
free! 1956 ALLIED



ELECTRONIC SUPPLY CATALOG

324 value-packed pages

Save on Everything in TV and Radio Parts & Equipment



Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers & Hi-Fi Specialists

Send for ALLIED's big 324-page value-packed guide to *everything* in TV, Radio and Electronics! Select from the world's largest stocks of High Fidelity systems and components; recorders and phono equipment; TV tubes, antennas and accessories; Amateur station equipment and supplies; P.A. systems; test instruments; latest build-your-own kits; industrial electronic supplies—plus *everything* in electronic parts, tubes, transistors, tools and books. Save on everything in Electronics—send today for your FREE 1956 ALLIED Catalog.

Everything in Electronics From One Reliable Source

send for it **FREE CATALOG**

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-F-6
100 N. Western Ave., Chicago 80, Ill.

☐ Rush FREE 1956 ALLIED 324-Page Catalog

Name _____

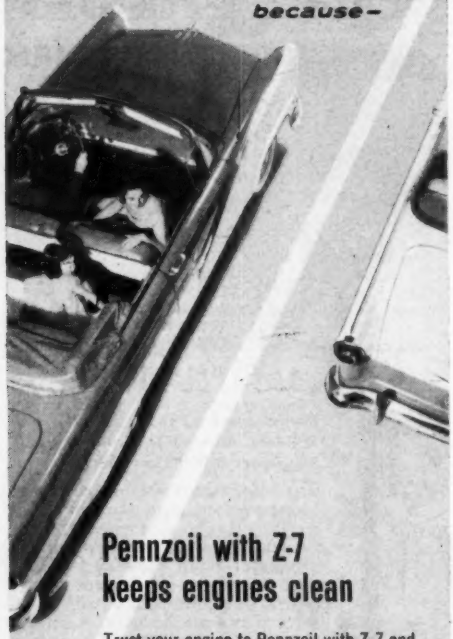
Address _____

City _____ *Zone* _____ *State* _____

Sound your Z...expect

PICKUP FOR KEEPS

because—



Pennzoil with Z-7 keeps engines clean

Trust your engine to Pennzoil with Z-7 and you can count on that extra burst of power when you need it! This different Pennsylvania motor oil with an all-oil body controls carbon and other deposits completely . . . prevents power-stealing knock and ping. By keeping your engine clean and smoothly responsive, it keeps horsepower unlocked—not for just a few miles after an oil change, but for keeps. To pass safely or flatten the hills, just sound your Z for Pennzoil with Z-7, The Tough-Film® oil, in the exact seasonal grade for your car!

IN EVERY STATE, AT DEALERS WHO **care** FOR YOUR CAR

MEMBER PENN. GRADE CRUDE OIL ASSN., PERMIT NO. 2, OIL CITY, PA.

NEW INVENTION ELECTROPLATES

METALS CHROME SILVER GOLD!

BRUSHES NEW PLATING ON EASILY! *Builds-up a thick, new Plating with each application*

Appli-I-Coter, an amazing new invention of modern science actually **plates metals as you brush.** It uses the mild, safe current of 2 flashlight batteries in the handle. **Replates** metal to a new **sparkle**—and the plating you apply becomes an **INDESTRUCTIBLE** part of the **metal itself!** Miracle solution Met-L-Cote for worn **Auto Chrome,** nickel, etc. All you do is **dip & brush** plating on! COMPLETE KIT & full instructions only $3.95. **Money-Back Guarantee.** Silver Plating Kit—$4.95, Gold—$6.95, Copper—$3.95. **Order the kit you want today!**

EMPIRE MERCHANDISING CO., Dept. JP-6A
28 E. First St. Mt. Vernon, N. Y.

MEN WANTED

Earn $100 Per Week and up
AUTO DIESEL MECHANICS

Master a trade with a future—learn Auto-Diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $100 per week and up. No previous experience necessary. Day and night courses. Approved for veterans. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave., N., Dept. 41 Nashville 3, Tenn.

LEARN ACCOUNTING Business Administration

Bookkeeping, secretarial and allied subjects at home in your spare time or attend nationally approved resident school. Write today for FREE Success Book giving complete details on courses, plans, rates and employment opportunities. G.I. approved.

Member National Home Study Council

Hills **BUSINESS UNIVERSITY AND EXTENSION SCHOOL, Dept. B.**
629 W. Main St., Oklahoma City 2, Okla.

LEARN MEAT CUTTING

Train quickly in 8 short weeks at Toledo for a bright future with security in the vital meat business. Big pay, full-time jobs—HAVE A PROFITABLE MARKET OF YOUR OWN! Pay after graduation. Diploma given. Job help. Thousands of successful graduates. Our 33rd year! Send NOW for FREE catalog. No obligation. G. I. Approved.

NATIONAL SCHOOL OF MEAT CUTTING, Dept. 51-G, Toledo 4, Ohio

ARTHRITIS—RHEUMATISM VITAL FACTS EXPLAINED

FREE DESCRIPTIVE BOOK

How crippling deformities may be avoided. This amazing FREE BOOK explains why ordinary methods give only temporary relief—if that. Describes a drugless method of treatment successfully applied in thousands of cases. Write for this 44-page FREE BOOK today. No obligation.

BALL CLINIC, DEPT. 36, EXCELSIOR SPRINGS, MO.

When Writing to Advertisers Please Mention Popular Science

WHOLESALE!

NATIONALLY FAMOUS Power tools, appliances, typewriters, watches, diamond rings, jewelry, tape recorders, musical instruments, phonographs, guns, cameras, shavers, sewing machines, etc. Big illustrated color catalog! Earn big profits! Details about unique self-operating sales plan included.

30 to 80% DISCOUNTS!

CONSOLIDATED DISTRIBUTORS
21-06 LAFAYETTE, PATERSON 23, NEW JERSEY

INSURED TIRE SERVICE POPULAR BRANDS

SPECIAL! Deduct 10% on orders for Two or More used tires

FREE INSURANCE POLICY given with each used tire sold. We guarantee the amount of service you pay for.

NOWHERE CAN SUCH QUALITY BE FOUND AT SUCH LOW PRICE!

YOU CAN'T LOSE!!

Super Quality — Rugged Performance — 8 Months Insured Service							
600x16	$3.65	670x15	$3.95	700x16	$4.45	760x16	$4.75
650x15	3.85	670x16	4.05	710x15	4.35	820x15	4.95
650x16	4.25	700x15	3.95	760x15	4.45	550x17	4.65

Supreme Quality—Nothing Finer—12 Months Insured Service							
600x16	$5.25	475x19	$5.45	700x15(6)	$10.45	700x20	$12.50
600x16(6)	6.75	640x15	4.95	750x16(8)	15.95	750x20(8)	15.50
650x16	5.75	670x15	5.35	700x17	11.95	750x20(10)	17.50
650x16(6)	7.25	710x15	5.45	750x17	16.45	825x20	21.50
700x16	6.35	760x15	5.95	750x15	10.95	900x20	19.95
750x16(6)	8.45	800x15	6.35	30x5	11.25	1000x20	20.45
550x18	4.95	820x15	6.35	600x20	10.95	1100x20	21.25
550x17	4.75	550x15	5.35	650x20	11.75	1000x22	21.95
650x15	5.25	670x16	5.15	32x6(8)	11.95	1100x22	22.75
700x15	5.35	700x16(6)	10.25	32x6(10)	12.75	1100x24	25.95

Whitewalls $1.00 extra.

MIDLAND TIRE SALES

Speedy shipments on Mail Orders. F.O.B. Chicago. Insurance policy sent with each order. Deduct 10% on orders for 2 or more used tires. Send CHECK or MONEY ORDER.—No COD's.
3701 S. Normal, Dept. SS-44, Chicago 9, Ill.

I Made $14,839 in 1 Year SERVICING RADIATORS!

Rex Ryan (Iowa) and hundreds of others earn $8,000-$20,000 a year servicing auto-truck-tractor radiators the Inland way. Inland, largest radiator servicing equipment mfgr., offers the complete package — equipment, merchandising, "Pays-for-itself" financing, and Free training school for customers.

WRITE for FREE Radiator Servicing Folder.

INLAND MFG. COMPANY Dept. PS-6 1108 Jackson St., Omaha 2, Nebr.

FIND HIDDEN RICHES!

NOW—find buried treasure, gold, silver, and metal objects, with sensational 3½-lb. locator—GOLDAK'S "FIND-IT" . . . only $49.50 complete with earphones, batteries, instructions.

Manufacturers of metal detection devices since 1933

Write for FREE literature full line metal, mineral locators; geiger and scintillation counters.

GOLDAK CO. 1544 W. Glenoaks Blvd., Glendale, Calif.

OIL BURNER SERVICING

Learn at home in your spare time. Earn big money

MASS. TRADES 161-B High St. Boston 10, Mass.

WRITE for FREE Sample Lesson

ATOMIC FALL-OUT WARNING DEVICE

Pen-size scientific instrument warns if nuclear fall-out in air reaches 50-Roentgen danger point. **Prevents needless panic or worry.** Anyone can use. Handy clip for pocket or purse. Only $2.00 postpaid with simple instructions.

AMERICAN INDUSTRIAL & SCIENTIFIC CO.
11838 W. Pico Blvd., Los Angeles 64, Cal.

Stamp Collectors SENSATIONAL

MONACO WEDDING

Have You Seen Grace? Grace Kelly-Prince Rainier Wedding Issue **Complete Set** of postage is yours, included in **Monaco Collection** with Giant Historical Set portraying Washington, Lincoln, Roosevelt & **Eisenhower** including Diamond shaped stamps, triangles, Saints & Princes. All together with a **48 Page Stamp Dictionary** for only 25c to introduce our bargain approvals. **STAMPEX CO., P.O. Box 47-AP, White Plains, N.Y.**

Complete set & more Only **25c**

NOW DRIVE UP TO 20,000 MILES and MORE . . . WITHOUT AN OIL CHANGE

- **PREVENTS ACID ACTION**
- **RETARDS OXIDATION**
- **HYDRAULIC VALVE LIFTS KEPT AT PEAK EFFICIENCY**

EASY TO INSTALL SIMPLY REPLACE YOUR OIL DRAIN PLUG

POS-MET
OXIDATION INHIBITOR

$3.98 POST PAID

TRUCKS $4.48

POS-MET OIL DRAIN PLUG IS UNCONDITIONALLY GUARANTEED OR MONEY REFUNDED

MANUFACTURED UNDER DIRECT LICENSE FROM THE NATIONAL RESEARCH COUNCIL OF THE CANADIAN GOVERNMENT

INTERNATIONALLY ACCLAIMED!

POS-MET—recently acclaimed in all leading Canadian and American Newspapers and Magazines is NOW available to American Car and Truck owners.

POS-MET—based on a development by scientists of the National Research Council of the Canadian Government—is capable of giving you up to 20,000 miles and more without an oil change. It is a new calcium alloy that *prevents* rather than reduces acid content. Oxidation is retarded and the performance of the entire engine is improved. Maintenance costs are reduced.

DO NOT CONFUSE WITH MAGNESIUM

Only a highly positive metal can do what we claim. The POS-MET alloy does *not* require that an acid content be present in the oil before going to work.

Foreign particles are kept in suspension—close tolerance parts are free to function at maximum efficiency —*Hydraulic Valve Lifts* are kept completely free of sludge, which assures you that the lifter will not collapse.

TO: **POS-MET PRODUCTS INC.**
1764 E. 7 Mile Rd., Detroit, Michigan
IN CANADA WRITE: POSITIVE METALS & ALLOYS Toronto 15, Ontario

Enclosed is $3.98 for Passenger Car Unit • Enclosed is $4.48 for Truck Unit • FLEET DISCOUNTS ON REQUEST

FROM: _____

_____

CHECK MONEY ORDER CASH

MAKE OF CAR MODEL YEAR

Finest Lightweight
Spinning Reels made in America

All American in name, performance and manufacture! H-I Spin Reels set new standards for quality, value and long, trouble-free service. Light weight—only 6 oz. . . . right- or left-hand operation, without interior adjustment . . . noiseless nylon gears, oil-less bearings . . . adjustable spool drag . . . anti-reverse button . . . handsome, long-lasting finish, with all fittings hard chrome plated.

Also a de luxe model 1903 ($15.00) especially balanced for super performance on glass rods.

Look for H-I on the tackle you buy

Rods, Reels, Lines, Lures, for every fisherman and every kind of fishing

Valuable Fishing Guide. Send 25¢ to
HORROCKS-IBBOTSON CO. Dept. PS-626 UTICA, N. Y.
Manufacturer of the largest line of fishing tackle in the world

---

LAW FREE BOOK THE LAW TRAINED MAN

Write today for a FREE copy of illustrated law book, **"THE LAW-TRAINED MAN,"** which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for **FREE** law training book today.

Blackstone School of Law, 225 N. Michigan Ave.
Founded 1890 **Dept. 120-A Chicago 1, Ill.**

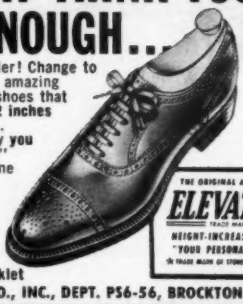
See the Greatest Show on Earth with this
GIANT ASTRONOMICAL TELESCOPE

$15.00 FULL PRICE

Delivered ready for use. Has 45X, 75X and 100 power individually mounted eyepieces with brass focusing tube plus sun projector lens for observing sun spots and solar storms. Steel telescope tube 50 in. long. Rigid 6 ft. tripod adjustable to any height. Steel forked mounting with closely machined aluminum tripod head assembly assures extra fine adjustments. This professional type instrument provides full power with clear vision at all times. See the moons of Jupiter, our own moon, planets, milky way, double stars, star clusters, etc. All for only $15.00 FOB Mattituck. Sent express. COD orders require $5.00 deposit. Satisfaction guaranteed. 200X and 400X eyepieces available at $2.00 ea.

SUFFOLK SCIENCE SERVICE
Dept. TP-6 MATTITUCK, N. Y.

YOU MAY THINK YOU'RE TALL ENOUGH... BUT



It's easy to be taller! Change to "ELEVATORS", the amazing height-increasing shoes that make you **almost 2 inches taller** instantly . . . confidentially. Only **you** know "ELEVATORS" secret, but everyone notices the difference. So, don't just think you're tall enough; BE SURE! Wear "ELEVATORS"!

WHAT DO OTHERS THINK?

Write for free booklet
STONE-TARLOW CO., INC., DEPT. PS6-56, BROCKTON 68, MASS.

ROAD TO RICHES

You can be the next uranium millionaire! Government guarantees huge bonus! **PRI** instruments from $29.95. See your local dealer today! FREE CATALOG!

Write PRI, 4223 PS W. Jefferson
Los Angeles 16, California

AUTO MECHANICS Train AT HOME for a GOOD JOB

A better job, big pay and security—America's No. 1 industry offers you all 3! **Make up to $125 a week** and more. Train quickly at home—earn as you learn. Tools and Tune-Up Kit sent. **Write for 2 FREE BOOKS.**

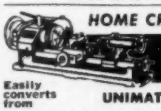
COMMERCIAL TRADES INSTITUTE, Dept. A-308
1400 Greenleaf Avenue • Chicago 26, Ill.

Watch Repairing Pays Big Money Learn at home

Watch repairers in great demand. Train step-by-step in 10 easy lessons. We furnish all tools and 15 jewel watch and practice movement. Turn spare time into cash. A licensed school. Low cost. Send for FREE book today.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870 Elston Ave., Dept. PS66, Chicago 18, Ill.

HOME CRAFTSMEN! HOBBYISTS! INVENTORS!



SAVE $100 ORDER DIRECT

UNIMAT 10 in 1 COMPLETE HOME POWER WORKSHOP

Easily converts from

1–LATHE into
2–Drill Press
3–Hand Drill
4–Polishing or Grinding
5–Tool Grinding
6–Milling
7–Jig Saw
8–Threading
9–Circular Saw
10–Indexing and Dividing

Save by eliminating all middleman profits! Send for FREE illustrated literature and reduced price list. These terrific savings are offered for a limited time only—Act now! Write for complete information to Dept. PS4, **American Edelstaal (Amsterdam) Inc., 350 Broadway, N. Y. 13, N.Y.**

Buy U. S. Defense Bonds

---

100 POUND SET $9.80

Extra Plates Only 10c Pound

BARBELLS

140-Pound, **CHROME DELUXE** Barbell-Dumbbell set only **$16.80.** This is our feature set and is the finest ever manufactured.

Training with adjustable weight is the **BEST** way to keep fit; the **ONLY** way to develop great strength and a perfect body. As the oldest and best equipped barbell company, **BUR** gives value and prices no one can equal.

SEND FOR FREE CATALOG.
BUR BARBELL CO.
Lyndhurst 5, New Jersey

MEN PAST 40

Troubled with GETTING UP NIGHTS, Pains in BACK, HIPS, LEGS, Tiredness Loss of Physical Vigor

If you have these symptoms then your troubles may be traced to Glandular Dysfunction . . . a constitutional disease. Medicines that give temporary relief will not remove the cause of your trouble. Neglect of Glandular Dysfunction often leads to premature old age and sometimes incurable malignancy.

The past few years men from over 3,000 communities have been successfully treated here at the Excelsior Institute. They have found soothing relief and a new health and zest in life.

The Excelsior Institute, devoted to the treatment of diseases peculiar to older men by **NON-SURGICAL** methods has a NEW FREE BOOK that tells how Glandular Dysfunction may be corrected by proven **NON-SURGICAL** treatments. This book may prove of utmost importance in your life. Write today. There is no obligation.

Excelsior Institute, Dept. B531, Excelsior Springs, Mo.

IT'S EASY . . .

MAKE MONEY IN PHOTOGRAPHY

If you are over 17—good pay and fascinating work await you in photography! Start making money quickly in spare-time—step into your own studio or exciting career job. LEARN-BY-DOING method trains you at home! Write TODAY for FREE catalog. Also Resident Training. Co-ed. 46th Year. Approved for Veterans.

NEW YORK INSTITUTE OF PHOTOGRAPHY
10 West 33 Street New York 1, New York
Dept. 5 **46th YEAR**

MARCO 14
$189.50 Delivered

Marco KIT BOATS · DO IT YOURSELF · SAVE 50%

8' to 14' models, factory to you, no dealers, mahogany decks and framework, all brass fastenings, 14' hull kits as low as $129.50 including freight charges in U.S.A. CATALOG 35c includes Kits, Hardware, Trailers, Fiberglas.

WRITE FOR FREE FOLDER
We can't ship for complete catalog
★ ACCESSORIES ★ FIBERGLAS
Marine ASSOCIATES
BOX 6188 S LONG BEACH 11, CALIF

Build Your Own Professional Instruments — Save 50%

EICO®

World's largest manufacturer of Kits & Instruments

Vacuum Tube Voltmeter
KIT $25.95
Factory Wired $39.95
Easy Instructions
46 models to choose from
Write for FREE new 1956 Catalog PS-6

Electronic Instrument Co., Inc. 84 Withers St., B'klyn 11, N.Y.

MODERN TRANSPARENT ROOF

Plates Repaired $5.00

Genuine Dupont Plastic NEW FALSE PLATE

From Your Old, Loose Plate NO IMPRESSIONS NEEDED

New, revolutionary Duplication System actually transforms your old, loose, cracked, chipped plate into a new, natural-pink Dupont Plastic Plate with same teeth or new, natural matched teeth. ONE DAY SERVICE!

Only $18.95

30-DAY MONEY-BACK TRIAL

SEND NO MONEY—Just your name and address for *FREE* details. *Save at our low price!* Highest prices paid for Dental Gold. **ALL-STATE DENTAL LABORATORIES, 22 W. Madison, Dept. 914, Chicago 2.**

PEE WEE BATTERYLESS TUBELESS "LIFETIME" RADIO

REALLY WORKS — FOR LIFE!

Works WITHOUT TUBES, BATTERIES OR ELECTRICAL PLUGINS. Will never run down or burn out! World's smallest. SMALLER THAN A PACK OF CIGARETTES! GUARANTEED TO RECEIVE LOCAL RADIO STATIONS ANYTIME—ANYWHERE YOU GO! **Sensational new Ferrite Selective Tuner** — Perma-Crystal diode. Super SPEAKERPHONE, durable black and gold plastic case.

SEND ONLY $2.00 (bill ck, mo) and pay postman $4.99 COD postage on arrival or send $6.99 for postpaid delivery. SENT COMPLETE READY TO LISTEN WITH LIFETIME GUARANTEE. Nothing extra to buy — ever. Available only from:
MIDWAY COMPANY Dept. WPS-6 KEARNEY, NEBRASKA

Become an Electrical Engineer

- **Major in Electronics or Power**
- **Earn B.S. Degree in 36 months**

Over 50% of the nation's industrial leaders began their careers with engineering training. Prepare now for a rewarding future as an Electrical Engineer or Engineering Technician. Enroll at the Milwaukee School of Engineering.

Plan Your Career—Eight Courses Give You Wide Range of Study

ENGINEERING COURSES
Electrical Engineering-Bachelor of Science Degree
Save a valuable year through optional year 'round study.
Electronics major ..... 36 months
Power major ..... 36 months

TECHNICIAN COURSES
Electro Technician ..... 12 months
Electronic Technician ..... 12 months
Radio Technician ..... 12 months
Radio and Television Technician ..... 18 months

SERVICE COURSES
Electrical Service ..... 6 months
Radio and Television Service ..... 12 months

MECHANICAL TECHNOLOGY COURSES — Also available, Service and Technician courses 6 to 18 months — Heating, Refrigeration, Welding, Air Conditioning and Mechanical —B.S. Degree in Mechanical Engineering with a major in Design, Metal Fabrication, or Plant Engineering.
Also, general 3-month preparatory course.

Terms open July, September, January, April

Prior Military, Practical or Academic training evaluated for advanced credit. Faculty of specialists. 50,000 former students. Annual enrollment from 48 states and 23 overseas countries. 52nd year. Non-profit. Residence courses only. Send handy coupon today.

MS-11A

MILWAUKEE SCHOOL OF ENGINEERING

MILWAUKEE SCHOOL OF ENGINEERING
Dept. PS-656, 1025 N. Milwaukee St., Milwaukee, Wis.
Send free illustrated career booklets ☐ Electrical Technology ☐ Mechanical Technology ☐ Radio-Television.
I am interested in _____
(name of course)
Name _____ Age _____
Address _____
City _____ Zone _____ State _____
If veteran, indicate date of discharge _____

You Can Depend On

STRONGER Yet SAFER ANACIN to relieve PAIN

Won't Upset The Stomach

Anacin® not only gives *stronger, faster* relief from pain of headache, neuritis and neuralgia—but is also *safer*. Won't upset the stomach and has no bad effects. You see, Anacin is like a doctor's prescription. That is, Anacin contains not just one but a *combination* of medically proven, active ingredients. Scientific research has proved *no single drug* can give such strong yet such safe relief as Anacin. *Buy Anacin Tablets today!*

Shrinks Hemorrhoids New Way Without Surgery

Science Finds Healing Substance That Relieves Pain—Shrinks Hemorrhoids

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain — without surgery.

In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all — results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne*)—discovery of a world-famous research institute.

This substance is now available in *suppository* or *ointment form* under the name *Preparation H.** Ask for it at all drug counters—money back guarantee. *Reg. U. S. Pat. Off.

TOOLS & HARDWARE WHOLESALE

MAKE EXTRA MONEY

START A BUYING SERVICE AT HOME. Get nationally advertised tools for self and clients at a wholesale DISCOUNT UP TO 50% off! Sales easy as you can give sizeable discounts. Still make fat commissions. A MILLION DOLLAR INVENTORY AT YOUR FINGERTIPS. Buy as you need it! You sell merchandise that is pre-sold for you through national advertising by the country's leading tool manufacturers. Send $1.00 (refundable) for dealers card and giant WHOLESALE CATALOG. Write TOOL DISCOUNT HOUSE, DEPT. #109, 318 MARKET STREET, NEWARK, NEW JERSEY.

Free! AIRMAIL COLLECTION

Get this spectacular collection of all-different, genuine Airmails from strange, far-away countries in Asia, Africa, Europe, the exotic Orient! World's largest airmail, scarce $27 stamp, old Zeppelin, many, many others. A truly remarkable collection containing stamps worth up to 40c each at catalog prices! EXTRA: new illustrated booklet "Men Against the Sky." PLUS Bargain Catalog and other unusual offers. Send 10c for mailing costs. ACT NOW!

JAMESTOWN STAMP CO. DEPT. F6PS JAMESTOWN, N.Y.

Foolish To Pay More—Dangerous To Pay Less!

One look will prove they're more than worth the difference.

Entire stock of our family-safe Top Grade, 40,000 mile Passenger Tires, (worn very slightly) at PRICES LISTED BELOW! IT'S CHEAPER THAN OFFERS OF $1. OFF OR "FREE TIRE OFFERS" ON ORDINARY USED TIRES. "The Blatt Name famous in tires for 40 Years—I don't just repair it, I offer a FREE FAST REPLACEMENT guarantee on ANY defective tire within 12 months. Frt. Excl. CHOOSE YOUR FAVORITE BRAND. Not Recaps or Retreads.

GOODYEAR Firestone

U.S. Goodrich, General, Atlas, Lee & others.

FREE This pictured tire ash tray given with 2 or more tires!

12 MONTH TIRE GUAR. & FREE FACTORY-TESTED TUBE

600-16	$5.28	670-15	$5.18	700-17	$9.98	750-17	$12.98
650-16	5.68	710-15	5.38	700-20	8.98	600-16(6)	5.68
700-16	5.78	760-15	5.38	750-20	9.88	650-16(6)	6.48
640-15	4.88	800-15	5.68	825-20	16.58	700-16(6)	7.08
700-15	4.98	820-15	5.68	900-20	15.58	700-15(6)	7.88
475-19	5.38	550-17	5.38	1000-20	17.28	650-20	8.98
WHITEWALLS $1.00 EXTRA				1100-20	17.28	750-16	7.38

MARVIN BLATT 609 Spring Garden St. Phila., Pa.

MILITARY MUD-GRIP TIRES

AA Guar. 6 Mos.		AAA 12 Months	
900-16	$ 9.58	900-16	$13.98
750-20	10.58	750-20	17.98

Send Check or M.O. & this ad for FAST shipment. FOB Phila. I personally select your tires—as if my future depended on it. Read that top line again.

Stammering?

BREAK THAT HABIT NOW!

SUCCESSFUL EMERY CORRESPONDENCE COURSE FEATURED IN NEWSWEEK & MEDICAL RECORD. WRITE TODAY FOR FREE INFORMATION.

EMERY INSTITUTE

P.O. Box 867-PS-6, Winter Park, Florida

GROW ORCHIDS AT HOME

BIG PROFITS SPARE OR FULL TIME

YEAR ROUND ANY CLIMATE NO EQUIPMENT

World's most thrilling hobby—profitable home business. Single Orchid plant may multiply into many—each as valuable as the first. Successful home grower shows you how! Raise gorgeous Cattleyas, Cymbidiums, Epidendrums, on living-room table. Big-profit orders come from friends, neighbors, florists, etc.—also Mail Orders. Illustrated secrets of the experts in simple "show-how" language AND blooming-size Orchid plants sent at NO RISK. Everything you need to start—for pleasure or profit. FREE—full details—SEND NO MONEY. Write today. TROPICAL FLOWERLAND, Dept. 26 4823 Wilshire, Los Angeles 5, Calif.

TERMITES IN YOUR HOUSE?

GET RID OF THEM YOURSELF!

DON'T PAY $300.00 AND UP TO ERADICATE TERMITES FROM YOUR HOME OR PREVENT INFESTATION. DO IT YOURSELF IN ONE AFTERNOON. EASILY! QUICKLY! INEXPENSIVELY WITH "TERM-OUT"! SEND STAMP FOR HANDBOOK

COMPASS RESEARCH

90-B CLAIRTON BLVD., PITTSBURGH 36, PA.

BUY IT WHOLESALE!

GET UP TO 40% OFF

☆ Start a Buying Service at Home, SPARETIME. GET BIG-NAME MERCHANDISE FOR SELF AND CLIENTS UP TO 40% LESS THAN REG. PRICE. SALES EASY, AS YOU CAN GIVE SIZEABLE DISCOUNTS, STILL MAKE FAT COMMISSIONS. *Post Card brings FREE COPY "The Wholesale Plan".*

FREE! "THE WHOLESALE PLAN"

American Buyers Service

HERTEL STATION, DEPT. PS BUFFALO 16, N. Y.

STOP BURNING OIL

MORE POWER MILEAGE SPEED

GUARANTEED TOP CAR PERFORMANCE FOR AT LEAST 15000 MILES WITH EACH TREATMENT

INCREASE COMPRESSION PICK UP

SAVE $75 ON OVERHAUL. DO IT YOURSELF IN 15 MINUTES

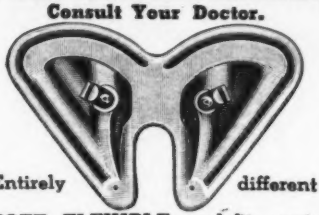
Just put our AUTO LIFE into your engine. It instantly goes to work to put a metal film around the rings and cylinder walls. With just 15 minutes of your time you have the equivalent of an expensive overhaul, for the fraction of the cost. It's so easy, anyone can do it. Nothing else to buy. SEND NO MONEY. We will send you AUTO LIFE C.O.D. plus postage. Or send $3.95 NOW and receive it postpaid. If after trying AUTO LIFE for 30 days, your car doesn't STOP OIL BURNING, GET MORE PEP, BETTER GAS MILEAGE and are not completely satisfied, we will immediately refund your money.

AUTO CHEMICAL LIFE IND., Dept. K-3, 239 Division St., N. Y. 2, N. Y.

If Ruptured

For lasting relief your rupture must BE HELD BACK DAY and NIGHT.

Consult Your Doctor.



Entirely different

SOFT, FLEXIBLE, and fits neat as a glove. The famous Miller saves you TIME, MONEY, DISAPPOINTMENT. Write for my FREE booklet today.

FRED B. MILLER Manufacturer
Dept. 3F Hagerstown, Maryland

GIANT BALLOONS

They're really BIG—surplus U.S. Govt. (new overage) Neoprene weather, target balloons. GREAT FUN in the backyard: at parties, picnics, dances, fairs. TERRIFIC for high school and college PROMS. They attract BIG CROWDS to business openings, civic events, conventions, exhibitions, trade shows.
ORDER TODAY! Approx. inflated sizes:

3 ft. dia., 49c—8 ft. dia., 99c
10 ft. dia., $1.59—13 ft. dia., $1.95

Postage paid on prepaid orders.
Calif. residents please add sales tax.

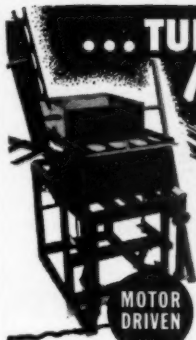
VOLUME SALES CO. **WAR ASSETS DIV.**
Dept. PS-656, 3930 Sunset Blvd., Los Angeles 29, Calif.

WHEELS WHEELS WHEELS

7" Disc Wheel ¾" Tire ⅜" sleeve	45c ea.
8" Disc Wheel 1½" Tire ½" sleeve	70c ea.
7" Disc Wheel 1" Tire ½" ball bearing	80c ea.
8" Disc Wheel 1½" Tire ½" ball bearing	$1.00 ea.
6" Disc Wheel 1.50 semi-pneum. Tire ½" B.B.	$1.35 ea.
8" Disc Wheel 2" semi-pneum. T. ½" B.B.	$1.50 ea.
10" Disc Wheel 1.75 semi-pneum. T. ½" B.B.	$1.50 ea.
10" Disc Wheel 2.75 semi-pneum. Tire ¾" B.B.	$3.50 ea.
12" Disc Wheel 1.75 semi-pneum. T. ½" B.B.	$1.85 ea.

Above wheel prices includes hub cap. Plus Postage. C.O.D.'s accepted.
AXLES—Sizes 5/16 in., ⅜ in., ½ in.—Cut to size—End holes drilled.

UNITED WHEEL STAMPING CO.
12131 S. PEORIA STREET PS-6 CHICAGO 43, ILLINOIS



... TURN CONCRETE INTO GOLD!

MAKE UP TO $75 A DAY IN YOUR OWN BUSINESS

If you want to have your own business — to start a business on your own — here's your big opportunity! New high speed, low cost General block machine produces up to 1,000 concrete blocks a day. Sell all you make to builders, supply houses, and others for homes, factories, buildings, garages. Cash in on the building boom! You can make profits of 100% to 150% — up to $75. a day! General block machine equipped with ½ h.p. electric motor — or can be supplied with gasoline engine — works anywhere, in little space, indoors or out. Operates from ordinary house light socket. Simple, foolproof 3 step operation — so easy a child can do it. Makes superior 3 core blocks any size from 4" to 12". Also makes chimney, sash, corner and other types. Blocks meet any building code anywhere in the country. Materials — sand, water, cement, available anywhere. Simple illustrated operating instructions and mixing formulas for cement and cinder blocks supplied with each machine. Write for FREE folder with full information.

MOTOR DRIVEN

R. L. T. of New York City reports: "MY GENERAL BLOCK MACHINE PAID FOR ITSELF IN FIRST 2 WEEKS!" Hundreds now in use the world over! Write for FREE details today!

EXTRA *Amazing illustrated book gives floor plans for 6 sensational concrete block bungalows. Tells how to lay blocks, lay out building lines, mix concrete, build steps, porch and concrete floors all at great savings. Written by experts. Can save many times the cost of the machine! Get it now! No strings attached. Send $1.*

HOW TO BUILD YOUR OWN CONCRETE BLOCK HOME Only $1 Prepaid

BOOK SENT FREE IF YOU BUY MACHINE.
$1 REFUNDED IF YOU BUY LATER.

GENERAL ENGINES CO.
DEPT. S-66 ROUTE 130, THOROFARE, N. J.

LEARN TO MOUNT BIRDS

ANIMALS, FISH, PETS

Be a Taxidermist. Save your hunting TROPHIES. Have a fine home-museum. Hunters, save and **MOUNT** your beautiful DUCKS, QUAIL, DEER, **TAN** skins, FURS. **Great Fun.** Spare-time **PROFITS.**

FREE BOOK Tells ALL about it. 100 fine wild-game pictures. 48 pages. SEND TODAY, don't delay. Get this WONDERFUL **FREE BOOK,** MEN AND BOYS. Learn Taxidermy. Double your hunting pleasure. Rush letter or **POSTAL** today. **STATE YOUR AGE.**

N. W. SCHOOL OF TAXIDERMY, Dept. 2E06 Omaha, Neb.

THANK YOU FOR TREMENDOUS RESPONSE! WE'LL SEND YOU $4.98 GIFT . . . FREE . . . FOR 3 EMPTY "MAGIC" BOTTLES!!!!

You have been magnificent! You swamped us with orders! Although we can ship promptly, our glass suppliers cannot keep up with our demands. So . . . PLEASE . . . send us back 3 empty bottles; one each of "PURPLE MAGIC", "WHITE MAGIC" and "LEATHER MAGIC" . . . and we'll gladly mail you . . . ABSOLUTELY FREE . . . a $4.98 Chop 'N Slice Block Set. (Offer expires August 31, 1956.)

"PURPLE MAGIC" — Used daily in speedy AUTO LAUNDRIES throughout the country. Washes as it Waxes. Shines as it Dries! Cuts carwashing time in half! Not a soap or detergent. Contains Veganin Wax. Two bottle caps sudsed up in bucket of water washes off most stubborn road grime. 8 oz. $1.

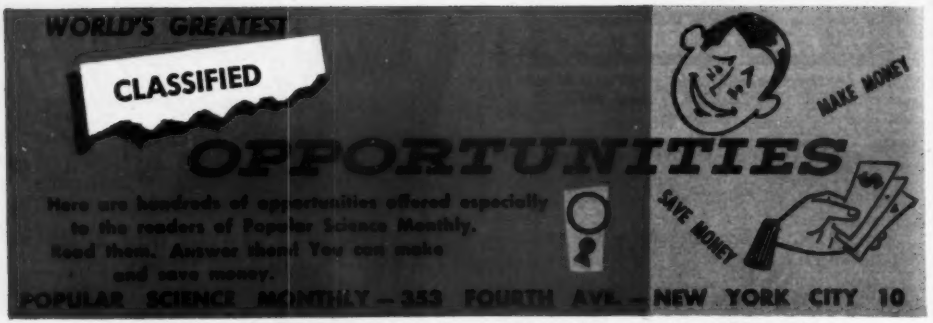
"WHITE MAGIC" — Insures dazzling, brighter white-wall tires! Easy-to-use. Simply spray on (with handy sprayer attached). Cleans, bleaches, whitens. 16 oz. $1.

"LEATHER MAGIC" — Cleans, softens, protects—all with one easy application. Anti-static additive eliminates annoying shocks. 16 oz. $1.

IF YOUR DEALER IS OUT OF STOCK, use coupon

CHOLDUN MFG. CORP., 331 East Street, New Haven 11, Conn.
SEND ME ☐ "PURPLE MAGIC" Concentrated Car Shampoo @ $1 ea.
☐ "WHITE MAGIC" White-wall Tire Cleaner @ $1 ea.
☐ "LEATHER MAGIC" Leather & Plastic Cleaner @ $1 ea.
☐ ALL THREE for $3.

(Attach coupon to letter. PRINT NAME & ADDRESS. Check or Money-Order. No C.O.D. We pay postage. Money Back Guarantee.)



Classified Ads only $1.00 per word insertion, payable in advance. Minimum ad 10 words. To be included in August issue, copy should be in our office by June 25. No cancellations accepted after June 15th. Address orders to O. K. Kelly, Classified Adv. Mgr.

1 AUTOMOBILES & MIDGET CARS

ASSEMBLE—the Mighty—Aquila—yourself. Send $1.00 for photos, information and price list. Be the first in your area to assemble this sensational 2 passenger sportster, equipped with powerful 26.8 horsepower air-cooled engine with electric starter, 550 x 15 tires and many more outstanding features. The car that any member of the family would appreciate. $1.00 refund first order. Eagle Machine Co., 481 Dyer Ave., Cranston 9, Rhode Island.

NON-Profit organization offers automobile literature — old, new and foreign; dealer books, service manuals; glossy photographs; free motor magazines. Write today; get on free mailing list. Auto Maniacs, Inc., Stockbridge, Michigan.

MIDGET auto plans $1.25—buy our parts. Gilmore, Box 26, Bowling Green, Ohio.

ALL makes 1956 automobiles wholesale. Save hundreds of dollars. Free details. Quality Products, 516 Fifth Avenue, New York 36.

CROSLEY engine parts, used, free list. Box 175, Winnebago, Illinois.

MIDGET Auto Plans, Parts, Plans $1.00 Postpaid. S&T Machine Products, Box 267, Carlisle, Indiana.

2 AUTO SUPPLIES & EQUIPMENT

FREE Discount catalog—Speed, power, custom equipment, Almquist Engineering, Milford 3, Pennsylvania.

BUY Wholesale nationally advertised auto supplies, thousands other products at big discount. Free "Wholesale Plan," American Buyers', Hertel Station, Buffalo 16-S1, N. Y.

LATEST Custom accessories . . . Items not in stores. New low prices. Continental tire kits, push-button doors, trunks, etc. New illustrated catalog . . . biggest ever, 25c. Eastern Auto, 3319-D South Grand, Los Angeles 7, California.

RADIOS' Custom for 1952-3-4-5-6 Fords $38.90. Free literature. Nordic Radio, Box 682, Evanston, Illinois.

AUTO Accessory & Parts Catalog. 1956 edition—All New! 180 pages. Save up to 50%—over 75,000 items, including Hollywood Accessories, Hi-Speed Equipment, Rebuilt Engines, all parts and accessories for all cars and trucks! Hard-To-Get parts! Send 25c (refundable). J. C. Whitney, 1919-PS Archer, Chicago 16, Illinois.

CHROME rear seat speaker Kits complete. Send $5.49, Barney's, 118 West A, Hutchinson, Kansas.

ELECTRONIC Miracle! Automatically time start, warm motor, anytime, any place. Complete plans, $3. Parts available. Electronic Sales, Box 13, Ottawa, Ill.

DANGER and annoyance eliminated from grabby, squeaky brakes. Patented compound. Easily and quickly applied. Prolongs life of linings. Ample supply for passenger car, small commercial Vehicle. $1.25 postpaid. Tate Mineral Products, 531—12th Street, Sparks, Nevada.

DETROIT Diesel New or Used GM-110 Fuel Injectors and Parts. Complete units up to $50.00. Bruce W. Mayer, 2090 East 19th Street, Cleveland 15, Ohio.

SHOCK Intruders Off Your Car. Instructions $1.00. Minor Watt, #1 Easton Ave., Lynchburg, Va.

LIX-Rust. Rust remover and chrome polish $1.00, Postpaid. Wasco, Box 1231, Sandusky, Ohio.

BUILD Your Own Supercharger—Complete plans and instructions, $1.00. Alanne, Box 135, Watertown 4, Conn.

DISCARDED GM71-110 Injector Parts Wanted. Bonus on HV. Mayer, 7120 Carnegie, Cleveland 3, Ohio.

TAPPET noises in Fords, Chevrolets and Mercurys stopped with our silencers. Literature. Kaye Products, 2067C S. Layton Blvd., Milwaukee 15, Wisconsin.

AMAZING Invention. "Lachapelle's" 100,000 Mile Motor Treatment. Renews older motors. Increases compression, power. Saves gas, oil, repairs. Only $3.00 delivered. Money-back guarantee. "You can't lose." Free circular. Write Joe Dillon, Authorized Warehouse, Agents Distributor, Box 323-B, Bridgeport, Ohio. Exclusive Agencies open.

STOP Hydraulic Valve Sticking—Save, Do It Yourself. Instructions Given $1.00. P.O. Box 68, Portland 7, Oregon.

ELECTROPLATE This Easy Way. Nonexpensive home method quickly plates autoparts, mirrors, novelties, etc. Free Booklet Write; Rapid Platers, Dept. 314, 1813 S. Clinton, Chicago 16, Illinois.

CROSLEY Parts—you Name it. Shipped C.O.D. Gene's, Ft. Smith, Arkansas.

JEEP Owners—V8 Power. Read Jeep Owners ad. Page 234.

MOTORIST Save Gasoline by Vacumating over rich mixtures. Fits on cars. For free particulars write — Vacumatic, Dept. 860, Wauwatosa, Wisconsin.

3 AUTO TRAILERS

EXCEPTIONAL Expanding eight foot trailer. Accommodates family of five. Build Yourself—literature, 10c. Framar Company, Wilmington, Mass.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

RECONDITIONED Motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 27, Missouri.

DOODLEBUG Motorscooter $15; Whizzer $14; Servicycle $20; Salsbury $40; Crosley Convertible $25; Outboard motorboat engine $5. (Mailorder Only). Send 25c, (35c for first class mailing) For Directory-Catalogue Number 71, listing these and hundreds of other bargains in homebuilders parts, plans, etc. Midget Motors Directory, Athens, Ohio.

CUSHMAN—small engine speed cams $8.50 exchange. High compression heads—Cushman $8.50. 25c Motorcycle Catalog. Weber Tool, Los Angeles 33, California.

SERVICYCLE $20.00; Whizzer Motorbike $25.00; Cushman motorscooter $25.00; midget auto $25.00. Rush 25c (35c first class mail) for new catalog #958 listing many other amazing bargains in motors, midget cars, motorscooters, motorbikes, construction plans. Associated, Box 534, Toledo, Ohio.

DIESEL Bicycle Motor, up to 300 miles per gallon Kerosene. Small in size—speeds up to 20 miles per hour. ¾ H.P. Write Newage, 222 York Road, Jenkintown, Pa.

1000 BANKRUPT Motorcycle Bargains Catalog 25c. Bunico, 146, Covington, Va.

16 TON, Racing & Stock Parts. Engine Bulletin 10c. Wichita Cycle Co., 813 Ohio Ave., Wichita Falls, Texas. Our 31st Year.

5 AVIATION

POWER Hammer! Sheet metal cutter. Circular on plans. Rush name. Maupin, Tipp City 6, Ohio.

BUILD Jet Helicopter Detailed Plans $6.00. Apache Aircraft, Elgin, Arizona.

BUILD a man carrying helicopter Jet Engine Yourself! "Practical Ram Jet Design" $1.00. "Practical Pulse Jet Design", $1.00. Also Centrifugal Propulsion Details $1.00 or Cyclic Propulsion Details $1.00. Decker Engine Works, Piasterco, Virginia.

SMALL Helicopter Theory and Guide Manual. Drawings. Construction Data. $4.00. Sandhill Aircraft, Box 315, O'Neill, Nebraska.

BUILD a fast, safe airboat or snow sleigh from your 65-200 H.P. aircraft engine. Propellers, Plans, Supplies. Satisfaction guaranteed. 48 page catalog 25c. Banks-Maxwell Co., Box 3301G, Ft. Worth 5, Texas.

AIRPLANE Action Colored Pictures. Six large 14X17. Send $1.00. Jarvis, Box 126, Bostonia, California.

BUY Surplus Aircraft; Fuselages; Accessories; Engines; Instruments; Electronics—Direct from U.S. Government Depots —List and Procedure $1.00. Brody, Box 8-PSA, Sunnyside 4, New York.

6 BATTERIES, GENERATORS, ETC.

ELECTRICITY from sunlight!! Solar energy!! Build electric plants, ovens, water, pool heaters, refrigerators, stills. See April Popular Mechanics. Send $3.00. Receive: Plans, cooker, patent disclosure, solar cigarette lighter, first lesson "Solar Engineering", written by scientists. Hedger Science Company, P.O. Box 357-B, Lakeside, California.

EDISON Nickel Storage Batteries. Any voltage, any amperage. Unconditionally guaranteed. Power Plants, Generators, Motors. Literature. Hawley Smith Co., Croton Falls 2, New York.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTROPLATING equipment, anodes and solutions for all types of plating. Instructions. Assemble your own plater and save. Free Catalog. Ramyr, Dept. E-2, 1624 East First Street, Los Angeles 33, California.

LAMPS—Parts Catalog containing wiring instructions, 25c. Gyro Lamps, 5402B Clark, Chicago 40.

TELEPHONE Transmitter. Hand set type. Suitable for inter-house phones, speakers or any communication purpose. Delivered two for $1.00. No C.O.D.'s. Telephones, Dept. C-726, 1760 Lunt, Chicago 26.

POWER Plants, all sizes, lowest prices. Builders Supply, Carrollton 2, Illinois.

8 WELDING, SOLDERING

PERFECT Flame burning with Amazing Neeco torch guides. Free illustrated folder. New Era Engrg. Co., 460 W. 29th Street, Chicago 16, Illinois.

WELDERS, 110/220, Welds ⅛". $39.50. Morris, 1070 Inner Drive, Schenectady, New York.

NEW, timesaving oxy-acetylene outfit welds, cuts, heats, brazes. Just change tips. Light, compact, portable. Thrifty to operate, ruggedly built. Complete outfit and instructions, only $76.50. Special economy plan for supplying gas cylinders. Write for free literature: Dept. S, Linde Air Products Company, 30 East 42nd Street, New York 17, New York.

"BUILD-Ur-Own" a.c. welder and a.c. power plant with a good used engine and low cost Hobart generator. Welds anywhere and supplies 8KW stand-by power for any emergency. Write Hobartweld, Box P-663, Troy, Ohio.

ACETYLENE Welding outfits new $49.00; used $29.00; Arcwelders $56.50. Eagle Welding, Dept. 42, 5085 Broadway, Chicago 40, Ill.

A. C. Welders, four sizes, lowest prices. Free Literature. Holgerson Co., Canton, Kansas.

BUY welding supplies direct from manufacturer. Cable, welding rods, helmets, etc. Portable arc-welders and kits at tremendous savings. Free factory catalog! LeJay 23, Minneapolis, Minnesota.

9 MACHINERY, TOOL SUPPLIES, ETC.

BUILD your own tools. 60 page book of drawings and catalog of castings. $1.00. Casting Specialties Co., Theinsville 12, Wis.

LAWNMOWER Sharpeners—New. $59.75 to $259.50, light and heavy duty, production. Turner-Cline, 430 Yellowstone, Pocatello, Idaho.

"SPEEDY" Drill Grinding Guide order from ad on page 244.

OIL Drum Cement Mixer, Assembly Kit, Circular. NuWayDo Co., Newaygo, Mich.

JEEP Owners—V8 Power. Read Jeep Owners ad. Page 234.

TOOLS 50% Discount Special 10 Unbreakable, Flameproof, Shockproof, magnetized screw drivers. 3" to 11" including Phillipshead and Radio Blades. $2.25 Postpaid. Free Metal Mounting Bracket. Dura Steel Tool Mfg. & Sales Company, Box 4426, Detroit 28, Michigan.

10 ENGINES, MOTORS, ETC.

GAS Engines 1½ H.P. ideal for Rotary Mowers, Pumps, etc. "Power Products" Brand New, Original Cartons, Were Priced $46.50, Special Price $19.95 (Postpaid if check enclosed with order). Literature, Money Back Guarantee, Free. Northern, 172-S Merrimac Street, Boston 14, Mass.

REWIND Motors yourself. Complete instructions $1.00. Lewis Mfg., Howell 11, Michigan.

11 BOATS, OUTBOARD MOTORS

NEW, used rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

FREE Catalog! Boat Kits, Trailers, Fiberglas, Marine Hardware. Luger Industries, Dept. K-6, 4452 Nicollet, Minneapolis, Minnesota.

BUY Wholesale nationally advertised outboards, thousands other products at big discount. Free "Wholesale Plan." American Buyers', Hertel Station, Buffalo 16-T1, N. Y.

OUTBOARD Motor Parts—New—Used—For All Makes. Send list of parts needed. Enclose stamp. We save you money. Outboard Motor Mart, Inc., 229S State Street, Boston, Mass.

SAVE nearly 20%. Outstanding aluminum outboard boats. See our advertisement page 56. Aqualine Boat Corporation, Yorklyn 4, Delaware.

FULL size, cut-to-shape Boat Patterns, Blueprints, 7½-38 feet. New 1956 illustrated "Build A Boat," catalog of 50 naval architect-designed Cruisers, Runabouts, Sloops, Skiffs, Outboard Boats, Sailing, Racing, Houseboats, 50c. Small Boat Hardware Catalog, $1.50. 1956 "How to Build a Boat" booklet, $2.50. Cleveland Boat Blueprint Co., Dept. A-77, Box 1651, Cleveland 4, Ohio.

ALUMINUM Boats—Grumman lifetime aircraft construction. More pleasure—less maintenance. Free Catalog—Boats or Canoes. Metal Boat Company, 3866 South, Marathon, New York.

BOAT Plans—Full Size Patterns—Frame Kits. Modern Inboards and Outboards for amateur builders. Complete New Catalog 50c or specify requirements. Glen Marine, Box 568, Compton, California.

FIBERGLAS Complete stocks. Send 30c for two fully illustrated handbooks on Coating and Molding. Allied Resin Products, 216 Milk Street, Boston 9, Mass.

MARINE conversions for Ford and Jeep engines. Catalog 25c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N.J.

AMIDON portable dock Fittings. Amidon Engineering Co., Elyria 21, Ohio.

A1 Rebuilt Marine Engines, Manifolds, Parts, Diesels. Helwege, 741 S. Ocean, Freeport, New York.

"GLASBOTE" Plastic and glass cloth for boat covering. Complete information and material price list free. Buchanan Plastics, Dept. M, 1728 Hamilton Road, Okemos, Michigan.

FIBERGLAS boat coating. Plexiglas boat windshields—clear, blue, green tints. Wholesale—retail. Complete information catalog—15¢. Gem-O'-Lite, Box 686S North Hollywood, California.

WHOLESALE! Sea Legs Boat Kits, factory prices from $31.98. Savings to 25%. Pre-assembled frames, pre-cut parts, illustrated instructions. Penney Woodcraft Industries, Dept. C-69, Defiance, Ohio.

OUTBOARD Motors Start Quick, Run Smooth Horsepower. RPM's increase with Solvatane. $1.00 postpaid. Guaranteed. 777 Raymond, St. Paul 14.

WATER skis $21.95, kits $9.95 up. Ladders $8.95. Enterprise Products, 28400 Gilchrist, Willoughby, Ohio.

SEAKOTE combats rust and corrosion. Gives longer life to metal surfaces subjected to salt air and spray. Boat and automobile chrome, aluminum boats, outboard motor cowls, tackle, tools, etc. Not a lacquer, but an oil-soluble, organic corrosion preventative. Active ingredients meet military specifications. Send $2.00 for easy to use, guaranteed, 16 oz. can. Postpaid. Florida orders add 6c tax. Gates Marine Specialties, Box 513-S, International Airport, Miami 48, Florida.

SAVE 69%, 12' Boat Kits, maximum H.P. 40. Details 10c. Damascus Boats, 1470 Binford, Ogden, Utah.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

BUILD powerful arms, chest, shoulders! 22 exercises, $1. Fonsad, Box 601-C, 1100 Market, Wilmington 99, Delaware.

BARBELLS—Free booklet, Health, Strength, Physique. Reading Barbell Co., Box 455, Reading, Pa.

100 TRICK Knockouts for self defense $1.—1c each. Priest, Box 251, Evanston 2, Illinois.

BUILD your own weights! Inexpensive! Easy! Practical! Excellent results guaranteed! Complete plans and training instructions, $3.00. Don Sandberg, 5322 Mayview Rd., Hopkins, Minnesota.

MUSCLE Development while sitting car or chair. Simple method shown in illustrated copyrighted booklet. Refund Guarantee. $2.00. Mathias, Box 206-S, Miami 47, Florida.

PUSHED around? Why take nonsense from Bullies. Give them the surprise of their lives. Easy when you know Police Jiu Jitsu. Complete fully illustrated course in one volume same as taught police and armed forces. Send $1 now for Police Jiu Jitsu postpaid. Satisfaction guaranteed. Books Publishing Company, Amityville 2, New York.

BARBELLS, Dumbbells, Exercise equipment Courses. Free booklet. Good Barbell Co., Reading, Penna.

FEAR No Man! "Modern Self-Defense" shows how! Completely illustrated Judo manual $1.00. Satisfaction guaranteed. Jim Barnett, 1028 E. 65th Street, Long Beach 5, California.

13 TAXIDERMY

WAX—Small Quantities. Formula $2.00. American Wax, 2425 W. Hutchinson, Chicago 18.

14 FIELD GLASSES, TELESCOPES

FREE Catalogue! Thousands war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 691 West Merrick Road, Lynbrook, New York.

WAR Surplus bargains! Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market place! Send only $1.00 for beginner's 10-lens kit and big instruction booklet Stock 2-CN. Write for catalog-CN Free! Edmund Scientific Corp., Barrington, New Jersey.

AMAZING prices binoculars, gunscopes. Free trial. Folder "Binocular Selecting", catalog free. Prentiss Importers, Mercury Bldg., West Los Angeles 25, California.

MICROSCOPE Catalog Free. Research Scientific Supplies, 60 Wall Street, New York 5.

SAVE. Buy United. America's largest selection. 103 models. $3.95 to $250.00. Use on 30 Day No Risk Offer! Free 56 Page —Binocular, Telescope, Riflescope Catalog. United, 9043 S. Western, A-2716, Chicago 20. Dealers Wanted.

REFLECTOR Telescope Kits $6.25 (3") to $175 (12"). Mirrors, Cells, Focusing Mounts, Tripods, Eye-Systems. Anything, everything in telescopes. Free Illustrated Catalog. Also ready to use telescopes from $25 to $176. Inquiries to Esco Products, Dept. PSM-6, Oakridge, New Jersey. Sales Showroom, 166 Church Street, New York City.

BUILD your own Reflector Telescope. Complete kit: Mirrors, Eyepieces, Tripod, all other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KP-20, Hartford, Connecticut.

REFLECTING Telescopes, completely assembled. 60X, $29.75. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

DYNASCOPE—Sensational New Reflector Telescope. Send for details. Criterion Company, Dept. DS-26, Hartford, Connecticut.

REFLECTING Telescopes, Mirrors, Kits. Lowest Prices Anywhere. Free Catalogue. Aurora Telescope Company, 266 Avenue C, Bayonne, New Jersey.

JOE'S Microscopes, 4827 Second, Detroit 1, Michigan. Lowest prices all sizes binoculars, microscopes, telescopes, catalog.

400X TELESCOPE easily made. Kit includes focusing tube, erector, five finished lenses and building instructions—$3.75. Giant astronomical telescope completely assembled with tripod—$15.00. Free information. Suffolk Science, Mattituck 4, New York.

ASTRONOMICAL Books, Star-Atlases, free list. Herbert Luft, 42-10 82nd Street, Elmhurst 73, New York.

BINOCULARS, telescopes, microscopes. Terrific values $3.98 up. Request free money-saving catalog. Criterion, Dept. S43, Hartford, Connecticut.

AMERICA's only Direct Mail Binocular factory. Also repair specialists. 40th year better binocular values. Write. DuMaurier Mfgrs., Elmira 30, New York.

MAKE 6" Telescope reflector. Glass, abrasives, instructions—$10.50. F. Cameron, Box 65, Inwood 96, New York.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

180 PROFUSELY illustrated pages, antique pistols, swords, daggers, armors, etc. 50c. Robert Abels, PS860 Lexington Ave., New York 21.

FREE Fish Catalog—148 Pages, Over 3,500 Hard To Find Fishing Specialties. Netcraft Company, Dept. PS1, Toledo 13, Ohio.

BUY Wholesale nationally advertised sporting goods, thousands other products at big discount. Free "Wholesale Plan." American Buyers', Hertel Station, Buffalo 16-U1, N. Y.

SKIN Diver's Catalog. Free. Shows everything from Aqua-Pencil to Submarine! Skis. Trunks. Books. Premiums. Aquafun P-S, Davenport, Iowa.

DE-Hook Fish Without Handling. Wonderful Instrument. Saves hooks, fish. $1.25. Dream Products, McKees Rocks, Pennsylvania. Dealers Wanted.

FREE giant handbook! "How to Bowhunt and Bowfish" 100's Revealing Secrets! Also Tells "How to Improve Shooting Accuracy. Select best equipment, make your own tackle, etc." Illustrated! Yours Free with large Bargain Catalog (Save 50% on archery equipment). Send 25c to cover mailing expenses refunded on first purchase. Supply Limited! Hurry! Malibu Archery, 1036-NJE South LaBrea, Los Angeles 19, California.

GUNS!!! Guns!!! Guns!!! Winchesters, Colt's, Kentuckies, Lugers. Antique—Modern Gun Bargains. Accessories. Arms & Armor. Big Bargain Catalog 50c. Agramonte's, 201 Warburton Avenue, Yonkers 2A, N.Y.

EARTHWORMS. Prized English Hybrid. Sensationally profitable! Bait! Soil! Breeders, 1000—$10.00. Best buy, gallon (culture, worms, eggs) $5.00. Postpaid. Instructions $1.00. Dealers write. Horton's Hatchery, 9492 S. Linden Rd., Swartz Creek, Mich.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

NYLON Rope, Lines, Cords. Every description for all household and sportsmen's uses. Finest made. Free catalog and samples. Beebe Cordage Co., Cranford 7, New Jersey.

FISHING Tackle—30% to 50% off! Also Guns and Camping Equipment. Cash or credit. Free Bargain Catalog—Write to: Klein's, Dept. C-P-6, 227 W. Washington St., Chicago 6, Illinois.

SAMPLE: 25c copy of "The Archers' Magazine." Send 10c: 1200 Walnut Street, Philadelphia 7, Pennsylvania.

JAP rifles altering American shells $6.00. Jap shells $3.65, catalog 5c. TP Shop. West Branch 10, Michigan.

MOLDS for Fisherman's Sinkers. Jigs, Squids, Casting and Spinning Lures. Free Catalogue. Sweet's Molds, Tonawanda 3, New York.

SKIN Divers—dive for profit! New underwater metal detector locates sunken outboard motors, cameras, etc. Waterproof, self-contained unit, illuminated meter. Free information. Goldak, 1540 W. Glenoaks, Glendale, California.

NEW Manual "Fishbait Culture, Care," Catching, Raising, Keeping, Selling, Using All Baits, Postpaid $1.00. Author Experienced Biologist. Garyco, Box 95, New Durham, New Hampshire.

MANY Modern, Antique guns. List 10c coin. Ed Howe, 26 Main, Coopers Mills, Maine.

BUY Wholesale! Best lines Sporting Goods! Direct Factory Representatives! Large Catalog $1.00. Refundable! General Wholesalers, Box 3058F, San Francisco.

JEEP Owners—V8 Power. Read Jeep Owners ad. Page 234.

16 CAMPING EQUIPMENT & TENTS

CAMPING Equipment, Tents, (direct from manufacturer). World's largest selection. Send 15c for 120 page 1956 tent & camping equipment catalogue-handbook. Morsan Tents, 10-21G 50th Avenue, Long Island City 1, New York.

BIG 1956 Catalog of Outdoor Equipment only 10c refundable on 1st order! Tents, sleeping bags, clothing, etc. Bargain center for the outdoorsman for over a decade! Rockaway Sales Co., Route 46, Rockaway 3, New Jersey.

CAMPERS, Outdoorsmen, Scouts! Send 15c for our "Camptown, U.S.A." giant catalog. Thousands of bargains. I. Goldberg & Co., 429 Market St., Phila. 6, Pa.

17 DOGS, BIRDS, HAMSTERS, RABBITS & PETS

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 177, 2954 Admiral Way, Seattle, Washington.

HAMSTERS—Pair $2.95. Free Booklet. Jer-Bre's Hamstery, 2425 Hoyt, Muskegon Heights 14, Michigan.

MAKE Big Money Raising Chinchillas, Cavies, Mink, Rabbits, or Pigeons for us. Free information. Keeney Brothers, New Freedom, Pennsylvania.

NATURALISTS — Prospector's Catalog 25c. Chameleon 85c. Quivira Specialties, Topeka 10, Kansas.

MINK, Quality Breeding Stock. Raising information, Cages, Equipment. Huebi Minkery, LeSueur, Minnesota.

ANGORAS, Chinchillas — World's most profitable rabbits! Catalog free. Grinsteads, Edwardsville, Illinois.

19 FARMS, OTHER REAL ESTATE

STROUT Catalog—Free. Farms, Homes, Businesses, Coast-to-Coast, 34 States, 3,046 bargains described. World's Largest; 56 Years Service. Strout Realty, 251-ZB 4th Ave., New York 10, N.Y.

10 ACRES Missouri land, $90.00. Warranty Deed. Free List. John Calvert, Plant City, Florida.

CALIFORNIA ranches $50 down. Huge investment profits. Future or immediate occupancy. Plenty jobs nearby. Free catalog. Pioneer Ranches, Inc., 7419-G Beverly Blvd., Los Angeles 36, California.

FLORIDA—Beautifully wooded Green Hills tracts Near famous Panama City pleasure resort. World's finest beaches. Many Lakes. Best fishing. Water Sports. 10 and 20 acre Garden Farms and money-making Tung Groves. Lowest prices—easy terms. Booklet Free. Douglas Wood, Fountain, Florida.

TEXAS Land: Beautiful Sites Near Mammoth Lake. Total Cost $149.50 per tract. Nothing Down $7.50 monthly. Ideal Climate, suitable for Retirement or Recreation. Low Taxes, City Water, Electricity, Phones. Write for Photos and map. Hugh Matlock, Department "PS", Pipe Creek, Texas.

HOMESITES $15 Monthly—California's finest garden section—Morro Bay's scenic shores. Wonderful fishing, boating. Fertile soil, softest water, temperate climate, congenial community. Free literature. Richard Otto, Department P, San Luis Obispo, California.

20 TREES, SHRUBS, ROOTS, HERBS

AMAZING New proved method Save 300% on New Lawn seeding and spot repairing, for full particulars send $2.00, G. Kofler, 5154 North 45 St., Milwaukee 9, Wisconsin.

21 POULTRY & SUPPLIES

RAISE pheasants on $100 week plan. Little capital and space can make you independent. Free details. Great Central System, Columbus 6, Kansas.

22 PROFITABLE OCUPATIONS

$5000 FROM Half Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

BUY Wholesale thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-M1, New York.

FREE Book "505 Odd, Successful Businesses." Work home! Pacific—37C, Oceanside, Calif.

$150 WEEK—easy! Start home Venetian Blind Laundry. Revealing book free. A. V. Co., 101 S. 44th, Philadelphia 4, Penna.

YOUR Own Wholesale Business With No Investment. Free Catalog. Jay Norris Co., 487-H Broadway, New York.

WHOLESALE Catalog! 30-80% Discounts! Appliances, Musical Instruments, Typewriters, Phonographs, Watches, Jewelry, Recorders, Housewares, etc. Consolidated Distributors, 21-19 Lafayette, Paterson 15, New Jersey.

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 101—2954 Admiral Way, Seattle, Washington.

JOBS—High Pay. South America, the Islands, USA, foreign countries. All trades. Clerical, labor, engineers, drivers, others. Women also. Fare paid. Application forms. For information Write Section 92C, National Employment Information, 1020 Broad, Newark, New Jersey.

HOME mailorder sources, methods, opportunities. Literature free. Carnahan Bros., 9610-D Acacia, Fontana, Calif.

WELDING Pays $$$. Learn easily at best equipped school in country. Nonprofit school with low cost training. G.I. approved. Write Hobart Trade School, Box P-662, Troy, Ohio.

FORTUNE Possible raising fishworms and crickets. Free Information. Carter Farm-10, Plains, Georgia.

MEN, women profitable work making figurines, book ends. Quickly learned. No expensive molds. Plastex, Water Street, Mount Holly, New Jersey.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Hayllinx-PS, Carlsbad, Calif.

FISHWORMS Urgently Needed! We shipped $3,175.75 worth, first year, spare-time, backyard! Why can't you? Raising, marketing instructions, 10c—Oakhaven 7, Cedar Hill, Texas.

PROFITABLE Bookkeeping. Simplified Instructions $2.00. Charles Karpal, 216 W. Jackson Blvd., Chicago 6, Illinois.

FRANCHISED distributorships, dealerships, agencies produce handsome incomes. Alert yourself! Request particulars. National Franchise Reports, R-528 333 North Michigan, Chicago 1.

EARN $40 weekly addressing envelopes, Instructions $1. Berkun, 2763 Linden, Knoxville, Tennessee.

MAKE new greaseless doughnuts in kitchen. Sell stores. Free recipes. Samuel Ray, 3605 South 15th, Minneapolis 7.

BIG Money Raising Nutria! Write Today! Aldridge, 3413B Danbury Road, Richmond 24, Virginia.

MUSHROOM Spawn ("Seed") plus growing, marketing instructions $1.00. Literature Free. Chrisenross, 641 South 19th, Newark 3, New Jersey.

AMAZING offer — Shellcraft Kit, for making jewelry $1.00—free catalog. Sea Shells, 10 West 18, New York 11.

23 BOOKS & MAGAZINES

FREE Catalog! Bargains for Everyone. Critic Books, 10020 Hawthorne, Inglewood 2, California.

BOOKS. Free 1956 catalog, 100 pages. Text, vocational, educational, instructional subjects. Millions of volumes, new and used. Bargain prices. Books bought. Est. 1902. Long's College Book Co., Dept. PS, Columbus 1, Ohio.

THE Bible Handbook is really the best low cost Bible instructor obtainable. 174 pp. $1.25. Alpha Books, P.O. Box 3002 Sta. B. South Bend, Indiana.

BRITISH Books—All Subjects, Catalog 10c. Wants solicited. Box 22-PSF, Brooklyn 26, New York.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service, 183 Hazelwood Drive, Westbury, New York.

NATIONAL Geographic Magazines 1888-1952. Any issue. Periodical Service. Box 465-PS. Wilmington, Delaware.

ATHEIST Books. Catalogue free. Truth Seeker Co., 38 Park Row, New York 8.

BOOK Catalog, 1000 interesting titles, send 10c. Books Publishing Company, Amityville 2, New York.

"DO-It-Yourself" Books. 150 Titles. List Free. Dixie Sales, Reform, Alabama.

24 HYPNOTISM

FREE Illustrated Hypnotism. Selfhypnosis. Catalogue. Write: Hypnotist, 8721 Sunset, Los Angeles 46P, California.

HYPNOTISM! Party Demonstrations, Neige Diehl, Post Office Box 2002, Seattle, Washington.

EX-Ray Mind! Hypnotize, one glance. Guaranteed $3.00. Wamsteker, Box 19, Ottery, Cape, South Africa.

PERFORM Hypnotism, mind-reading, the mysterious, powerful. 100 professional tricks $1.—1c each. Priest, Box 251, Evanston, Illinois.

HYPNOTIZE Successfully! Learn easy, fast, modern methods—including secret nerve pressure technique (Guaranteed harmless)! Complete illustrated course $1.00. H. Fowler, 1252 Dahlia Lane, Wantagh, N. Y.

STUDY Hypnotism! Amazing illustrated lessons. Big 280-page treatise jam-packed with fascinating information. Simple understandable language you'll enjoy. Full price only $2.95 postpaid—or C. O. D. Plus Postage. Satisfaction or refund guaranteed. Order "Hypnotism" today. Nelson Company, 210 South Clinton, Dept. 2FU-1, Chicago 6.

HYPNOTISM. Complete course on tape, $4.00. Free information. Book list. Drawer 697-PS, Ruidoso, New Mexico.

HOLLYWOOD's Television Hypnotist, Emile Franchei, offers only complete written course—Failures sell gadgets and books. Modern School, 6252 Woodman, Van Nuys, California.

FUN Galore using 3-D Mechanical Hypnotist. Fascinating New device plus book, instructions, secrets, simple to follow. Instantaneous Hypnosis. Age Regression, etc. Try it! Satisfaction Guaranteed or Money Back. Both $1.98 ppd. Hypnotic-Aids, PS-6, 30 East 20, New York City 3.

FREE literature; Hypnotism, Autohypnosis, Mechanical hypnosis. Revealed by scientists. Hypni, Box 6097, Oklahoma City 11, Oklahoma.

HYPNOTHERAPY, Psychology. Diploma, Degree Correspondence Courses. Aureaf, 156 West 73rd Street, New York City.

HYPNOTIC Coin—plastic lenslike surface causes whirling appearance. Complete with Hypnotic instructions, secrets. Guaranteed. $1.00 each, 3 for $2.00. Hypnotic-Coin, 6-PS, 32 East 20, New York City 3.

HYPNOTIC Tricks—anyone can do. $1.00. Miken, Box 193, Lemoyne, Penna.

HYPNOTISM, Autohypnosis Books, Mind Power Suggestion Records. Free Catalogs. Lloyd Collins, Appalachia, Virginia.

SERIOUS about Hypnosis? Professional Center offers ½ hour personal instruction tape recording including re-incarnation information, $5.00. Box 3191, West Palm Beach, Florida.

25 MAGIC TRICKS, PUZZLES, ETC.

BEST magic. Joker's novelties. Lower prices. Catalog 10c. Top Hat, Evanston 13, Illinois.

500 TRICKS. Douglas famous 120-page Catalog, only 10c. Fastest service to magicians for 30 years. Send 10c today. Douglas Magicland, Dept. 2, Dallas, Texas.

TEN different party joke gadgets $1.00. Paul's, Box 22-PS, Brooklyn 25, N. Y.

"102 MAGIC Tricks" plus 500 trick catalog 50c. Stowell's, Woodstock, New York.

GAMBLING System Exposed. Book $1.00. Catalog 10c. Book, Box 671, St. Louis 1, Missouri.

BE a Magician! Large professional catalog of latest tricks, 35c. Ireland, F-109 North Dearborn, Chicago 2, Illinois.

"SVENGALI Deck" trick cards 50c with catalog. 1746-S Market, Philadelphia 3.

FREE 50c trick and $1.00 catalog. Send only 75c. Terry Magic Studio, 1921 66th Street, Brooklyn 4, New York.

DOLLAR Magic Set Free with Catalog 25c. 4462-PS Germantown, Philadelphia.

SMOKEBOMBS 25c, 7 for $1.00. (Terrific!) 4463-PS Greene, Philadelphia 44.

"VENTRILLO" Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia. 5.

SENSATIONAL Magician's Wand (Vanishes Handkerchief!) 25c, catalog included. Box 1352-PS, Philadelphia 5.

26 COINS & CURRENCY

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 56 years.

FREE! Foreign coin banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-50, Mass.

BARGAIN lists, Indianhead cent, 10c. Economy Sales 156-B Dean, Mansfield, Mass.

AMERICAN Coins! Stamps! Extensively! Sullivan, 127-DD East Fourth, St. Paul 1, Minnesota.

$12,500 FOR one silver dollar! What are other U.S. coins worth? Fell's U.S. Coin Book gives value of all U.S. Coins from Colonial times to present. Also, how to collect them, what makes them valuable, how to sell coins, and everything else. Profusely illustrated, hard-cover book. $2.00 postpaid from: Fell, Publishers, 386P-11 Fourth Ave., New York 16.

BRILLIANT Uncirculated complete sets — Jefferson Nickels $19.75; Roosevelt Dimes $14.95; Franklin $½ $27.50. Giant Bargain Catalogue 50c. Bebee's, 4514 North 30th. Omaha 11, Nebraska.

THOUSANDS foreign coins. Lists 6c. Lauren Benson, 2526B Middle Road, Davenport, Iowa.

FIVE foreign coins from Switzerland, Belgian East Africa, etc. plus foreign banknote, only 10c with coin approvals. Littleton Coin Company, Littleton R2, New Hampshire.

$3,000.00 FOR 1913 Liberty Head Nickel. Dimes 1894-S, 1895-O, 1916-D. Quarters 1827, 1896-S, 1901-S, 1913-S, 1923-S, we pay $5.00 to $1,500.00. Certain dates—Lincoln Cents, $60.00. Indianheads, $60.00. Large Cents, $500.00. Eagle Cents, $300.00. 2c Pieces, $45.00. 3c Pieces, $60.00. Half-dimes, $500.00. Shield Nickels, $100.00. Old Dimes, $300.00. 1875 Canadian Quarter, $50.00. Hundreds of others worth $5.00—$500.00. Wanted—Half Dollars, Dollars, Gold Coins, Paper Money, etc. Know their true value. Our large illustrated Guarantee Buying-Selling Catalogue, giving complete allcoin information—send $1.00. Purchase catalogue before sending coins. Catalogue money refundable. Worthycoin Corporation, Leaders Numismatic Quotations (K-137-C), Boston 8, Mass.

MORGAN Dollars; 1878-79-80-81-82 uncirculated $2.00 ea. Illustrated coin catalogue 25c. Shultz, Salt Lake 10, Utah.

UNCIRCULATED Sets and Singles—Coin Supplies. Write for Prices. Louis Bell, Masonic Building, Decatur, Alabama.

EIGHT different Liberty Nickels $1.00. Five different Canadian Large Cents 50c. Six different U. S. Indian Cents 25c. Our price list of U. S. and foreign coins included with order. Bryson Stamp Company, 612 White, Toledo 5, Ohio.

SENSATIONAL illustrated U.S. 16 page coin list, 10c. Stoney, 192-S Washington, Boston 8, Massachusetts.

U.S. Large cent, 2c piece and bargain list, only $1.00. Delmaco, Box 1123B, Wilmington, Delaware.

18 NEW coins 18 countries $1.00. Genuine, $3.25 in album, spaces 96 countries, sliding windows. New, 45 countries, $3.90, in album $5.90. Album alone, $2.50. Africa, Vatican, Curacao, Seychelles, Travancore, Snake, birds, animals. Square, scalloped. Lists 10c. World Coin Company, Box 401, Davenport 5, Iowa.

FOREIGN Coins 10 Diff. 25c. Foreign Bills 20 Diff. 25c. Indian Cents 10 Diff. 50c. Lists. O. Arnold, Macon, Missouri.

20 DIFFERENT Indian Head Cents—$1.00. Lists free—Chelsea, 10 West 18th St., New York City 11.

COIN Magazine, 160 pages. Sample 35c. Numismatic, 7320 Milwaukee, Chicago 31.

28 STAMP COLLECTING

TWO $5.00 US stamps plus 20 different, 10c with US approvals. Irwin Stamp Co., Box 1109, Brooklyn 30, New York.

300 DIFF. World wide 25c. Plus surprise packet. Mammoth packet list free. Econopackets, Box 168, Riverside 22, Calif.

50 DIFFERENT U.S. 5c with bargain approvals, lists. Bookman, Box 8245-S, Madeira Beach, Fla.

PENNY Approvals by country, M. H. Hoerning, Merriam, Kansas.

AMAZING Offer! 200 U.S. stamps—including commemoratives, airmails, high denominations to $1.00—only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

WEIRD Diamond Shape Coffee Stamps, lovely Flower Triangle. First American Big Commemorative, Greenland Idol Dancer, etc. Free with approvals. Capital Stamps, Little Rock 10, Arkansas.

"WOW! 135 All Different Germany 10c" Zeppelins, Semi-Postals, Airmails, High Values. Big bargain lists and approvals included. Jamestown Stamp, Dept. A6PSC, Jamestown, New York.

ADD 10,000 different stamps of the World to your collection for less than ½c each. $5. down, $4.25 month brings you book of 1000 each month for ten months. I. Huppert, 1972 East 18th Street, Brooklyn 29, New York.

U.S. Classics—Over 50 Yrs. Old. 15 Selected oldtimers. Missing in biggest collections. All 15 at less than 1c each. 10c with approvals. Jaro, Box 246-P, New York 8.

225 STAMPS For only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries cataloging up to 25c each! Also Approvals. Mystic Stamp Company, Camden 55, N. Y.

100 DIFF. Latin America 25c, Packet list Free. Econopackets, Box 168, Riverside 22, Calif.

FREE! Catalog! About stamps. Illustrated. Free! The Stampmart, Hartford 1, Conn.

UNITED States commemorative collection containing 33 different—10c;—approvals. White, 516-W Avenue L, Brooklyn 30, New York.

FREE!! Giant Catalog Offering thousands of bargains Sent with beautiful approvals. Jamestown Stamp Co., Dept. E6PSC, Jamestown, New York.

FREE U.S. Stamps. 1943 Occupied Nations Flag, Airmails, Commemorative included in Collection of 25 Different U.S., Plus $5.00 Stamp. Everything for 10c Mailing charge. Approvals. Willett Stamps, 141-T E. Main St., Mount Kisco, N. Y.

WORLD'S Largest Stamp (7½x14 inches). A real curiosity! Retails for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

ICELAND 10 different beautiful stamps for only 10 cents to applicants for our good old fashioned approvals. Old Colony Stamp Co., Dept. B, Milford, Conn.

RED China—25 different unused issues for 3c postage. Approvals. Falak, 6023-P-25th, Kenosha, Wisconsin.

TRAVEL thru 50 countries! A virtual world cruise! 50 stamps, each from a different country, Abyssinia to Zanzibar. Bargain unsurpassed! To new approval applicants, 5c. Avalon Stamp Co., Dept. S, Springfield, Mass.

DEALERS Wholesale catalog. Postage 3c. Franksco, 5031 Queensbury, Baltimore 15, Maryland.

CANADA—Newfoundland collection including early issues, commemoratives, pictorials and high values. Plus set of fascinating triangle stamps. Plus set of unused British Colonies. Plus large stamp book. All four offers free. Send 10c to cover postage. Empire Stamp Corp., Dept. PR, Toronto, Canada.

ROOSEVELT Greece, Pope Triangle, Greenland, Israel, 51 others, 5c. Approvals. Longhorn, Box 3068-P, Lubbock, Tex.

KOREA Flowers, Formosa Chiang Kaishek birthday issue, Hungary pictorials, Ceylon (elephant) Royal Visit, South Africa Cape of Good Hope triangle Centennial, Italian Colony flowers, Niue bi-color maps, African wild animal set. Many more beauties. All for 25c with interesting approvals. Every continent represented in this collection. Modern Stamp Co., Dept. B-3, Ferrysburg, Michigan.

FREE—Stalin Giant "Iron Curtain" Set. Approvals. Seminoles, Dayton, Tenn.

"POPE" Triangle set giant Flags, Maps, Stalin, 25 others, 3c. Approvals. Wright, 1127-P Gorsuch, Baltimore 18, Maryland.

FREE Monaco Rainier-Kelly Wedding Mint. Dolinco, 31 Park Row, New York City 38.

HOW Many of your album pages would a few stamps complete? Want to fill them? Try our approval books of 1,000 at 1c and 2c. Values will amaze you. Also U.S. Roseland Stamps. Dept. B-36, Spring Lake, Mich.

FREE: Mint British Colonies from Brunei, Papua, New Guinea, Caymans, Gilbert Ellice, Seychelles, Sarawak, Grenada. Free with approvals. Viking, Great Neck 5, N. Y.

CLEAROUT Sale Unbelievable prices. Free pricelists. Sentinel, Saginaw 31, Michigan.

100 DIFFERENT U.S.—50c Approvals. Utechts. 1143A North Keeler, Chicago 51.

"IRON Curtain" Giant Collection, catalog 53c for 3c Approvals. Worldwide, Box 88-A, El Prado, New Mexico.

PICTORIAL Packet from Antigua, Barbados, British Guiana, British Honduras, Burma, Curacao, Leewards, Rhodesia, Trinidad, Tobago, and many other hard to get countries. Bi-colors, topicals. Tremendous value. Each stamp a beauty. 10c with inexpensive, attractive approvals. Wolverine Stamps, Dept. B-27, Fruitport, Michigan.

LOOK! 200 Stamps, Hinges, Tweezers, Perforation gauge, watermark detector 15c to approval applicants (U.S. residents). Montalto, New Church, Virginia.

513 DIFFERENT Worldwide from Cunha, Sudan, Libya, etc., cataloging over $10 only 35c. Approvals. Littleton Stamp Co., Littleton Q2, N. H.

WORLDWIDE 200 better mixture 25c. Gerhardt, 405 East 6th, Austin 1, Texas.

FREE! Monaco's Grace Kelly-Prince Rainier Wedding Stamps given applicants for our exotic approvals. Exotic Stamps, Box 462-SS, Coral Gables 34, Florida.

50 DIFFERENT British Colonials! Plus dozen Confederates (Facsimiles) Dime!!! Gene's, 1707N Congress, Austin, Texas.

500 AROUND The World Mixture 25c. Monjar, Fairmount, Cincinnati 14, Ohio.

105 DIFFERENT Canada only $1.00. Saiga, Box 308, Wainwright, Alberta.

FIRST U.N. Set. Among World's Prettiest. Only 10c. Approvals. Welles, Box 1246-V, New York City 8.

U.S. Stamps—at discount prices. Giant illustrated catalogue. Only 10c. Raymax, 37-VX Maiden Lane, NYC 38.

FREE! Set Flower Triangles, Rhineland, Anchal, Others. Approvals. Delton Page, Box 201P, East Paterson, New Jersey.

14,000 DIFFERENT yours on our streamlined, systematic Club plan for only 50c weekly. Big shipment every two weeks. Details free. Sjoquist, Box 217, Valley Stream 70, New York.

ECONOMICAL ½-1-2c Approvals, 22,000 varieties available. Dresel, Box 270-T, New York City 25.

100 OLD U.S. Stamps between 1861 and 1935 $1.00. Rousch Stamps, 51 Chestnut, Mansfield, Ohio.

FREE Sample—Interesting, informative, illustrated! National Stamp News, Anderson, South Carolina.

100 JAPAN 10c, with approvals. Gould's, Box 631, San Francisco 1, California.

30 DIFFERENT Commemoratives 1893 up 10c. U.S. Approvals 10 mint sets 15c, Foreign Approvals. K & B, Box 70, Brooklyn 23, New York.

BEAUTIFUL collection. Fifty large pictorials from fifty Countries, only 50c. Ask for approvals Faith, 1235 Campbell, Alhambra, California.

U.S. Revenues on approval. Eljay Stamps, Box 286S, New York 36, New York.

WONDERFUL Offer Seven complete mint sets only 10c with approvals. Reich (S26), 1033 Lawrence, Chicago 40.

MINT U.S. Specials! 13 Different commemoratives, 25c; Flag Set, $1.00; 4 different Souvenir Sheets, $1.00. Free Price List. Brooks, 2352-C East 23rd Street, Brooklyn 29, New York.

COLLECTORS Outfit 5c!! Stamp album, packet of stamps, gauge, lists, etc. Approvals included. Adventurers, Buckland, Connecticut.

TURKEY. 100 Different, only 25c with quality approvals. Livingstonville Stamp Co., Middleburg 6, New York.

APPROVALS Prices Low. Indicate Countries Wanted. Box 11, Montreal 28, Canada.

THOUSANDS of Exciting Stamps. All Different, Yours for 1c, 2c each. Fill your Album for Pennies! Big Collection Sent for Free Examination. Cole, 43-G Rinewalt, Buffalo 21, New York.

CONFEDERATE Jefferson Davis (Guaranteed genuine)—50c. Approvals. Gatewood, Box 346, Winston-Salem, North Carolina.

OLD U.S., famous Americans, flags, commemoratives 25 stamps 10c only to new applicants for U.S. approvals. Metropolitan Stamps, Box 312-S, Jackson Heights, New York.

IRRESISTIBLE Offer 25 Different French Colonies Used Including Giant Airmails 25 Cents Approvals. Bernou, Route 1, Clearwater, Florida.

1000 DIFFERENT $1.00 with approvals. Lewis Golden, 6721 Eastwood, Philadelphia 49.

70 DIFFERENT U.S., including 35 Commemoratives 25c. Seidenberg, Appleton, Wisconsin.

OLD scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfeld, Clintonhill Station, Newark 8, N. J.

RHODESIAS—Fourteen Different Including Queens 10c. Approvals Accompany. Douglas, Hawkesbury, Ontario.

SENSATIONAL illustrated U.S. 72 page catalogue free. Stone, 192-S Washington, Boston 8, Massachusetts.

SELECT U.S. on approval. Mint, used. Kingsbury Stamps, Fairfax, Vermont.

PENNY Approvals jammed with Bargains. For better values, try Putnam Stamp Company, Mahopac, New York.

100 DIFFERENT Spain 25c. Penny approvals included. Reed, Box 980, Chicago 90, Illinois.

TRINIDAD. 12 different. 10c with approvals. Seminole Stamps, Box 1138-S, Coral Gables 34, Florida.

19TH Century U.S. 41 different $1.00. Charles Chase, 152 Court, Portsmouth, New Hampshire.

EXCITING, Colorful Olympic and Sport sets. 14 Beautiful stamps. 10c with approvals. Elliott Norton, 105 Brees Blvd., San Antonio 9, Texas.

MONACO Triangle set Free. Approvals. Weitz, Box 83G, Orange, New Jersey.

WORLDWIDE, 50 all different,, absolutely free, just to introduce our incomparable approvals. Kent Stamp Company, GPO Box 87, Brooklyn, New York.

EXCITING "Strange countries" packet. Free with approvals! Saxon, Santa Ana, California.

LUXEMBOURG 25 different 5c. Approvals. Neal, 5950 Tower, Riverside, Calif.

3 SOUVENIR Sheets (Regular 50c value), only 10c with approvals. Variety Stamps, 57-S Circuit, Newton Highlands 61, Mass.

UNITED States, Canada, or British Colonies Collections on Approval. Enclose 10c. Peterson, 405 Empire Bank, St. Paul 1, Minn.

MONACO'S "Grace Kelly" Wedding set free to "Approval Buyers". Royal Stamp Company, Tamaqua 2, Penna.

200 DIFFERENT Including Macau, Rhodesia, Mauritius. 10c to approval applicants. Evden, Box 128, Valley Stream 42, New York.

29 ANTIQUES, RELICS & INDIAN GOODS

4 AFRICAN Arrowheads $1.00. Waters, 1383-87 East 26th, Brooklyn 10, New York.

SELLING 50,000 Indian Relics, arrowheads, etc. List free. Lear's, Glenwood, Arkansas.

3 WAR Arrowheads, Scalping Knife $2 00. List Free. Arrowhead, Box 1249, Hot Springs, Arkansas.

ARROWHEADS, assorted: Thirty $5.00, hundred $15.00. Catalog 50c. Tilton Relics, Topeka 10, Kansas.

FOUR Select Arrowheads $1.00. Spear $1.00. Axe $2.75. Celt $1.50. Palmer, 435 Washington Road, McKeesport, Pa.

30 MINERALS & PRECIOUS STONES

LARGEST gem and mineral magazine tells how to have profitable fun with rocks, gems, jewelry. Monthly. $3.00 year. Sample 25c. Gems & Minerals, Dept. S-6, Palmdale, Calif.

GEMCUTTING—Silvercraft magazine. Learn to cut gems, make jewelry. Ads give sources equipment, gems for cutters, collectors. Free literature. Sample copy 25c. Lapidary Journal, Del Mar 3, California.

GOLD, Silver, Copper Ore and Catalog 50c. Gemco, Elsner Ave., Sheboygan, Wisconsin.

HIGGINS' Gems & Minerals. Finest quality. Free price list. 2117 Park, Salem, Oregon.

SAPPHIRE, Topaz, tourmaline, garnet, peridot. Five uncut gem specimens, $1.00. Ten polished gems, baroque shaped, $1.00. Free big bargain list jewelry, gems, profitable, easy, do it yourself projects. O'Brien's, 1116B Wilcox, Hollywood 38, California.

TWENTY-five minerals plus Geology booklet $2.00. Ten polished baroque gems $1.00. Free price list. Money-back guarantee. Reed's, 4930 Palo Alto SE, Albuquerque, New Mexico.

GEMSTONES, Mineral specimens for cutters and collectors. Every variety. Lowest prices. Free catalog. Plummer's, 4720 Point Loma Avenue, San Diego 7, California.

COLORFUL Assortment of Petrified Wood $1.00. John Selmar, 1015 Atkin Avenue, Salt Lake City, Utah.

31 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 631-E St., N. W., Washington 4, D. C.

65 ASSORTED Army Patches, Insignias, Ribbons $1.00. Surprise included. Lhgco, 19-Y East 16 St., New York City 3, N.Y.

25 DIFFERENT matchbook covers from Fabulous Las Vegas! Collector's items; only $2.00 prepaid. George's Match Service, 721 Fremont Street, Suite 6, Las Vegas, Nevada.

GIANT roaring sea Shell also 30 others, each different. Ideal for collectors, jewelry, novelties, aquariums. Send $3.00 to: Florida Novelties, 410½ Memorial Highway, Tampa 9, Florida.

HOBBIES, Crafts and Models Catalog 10c. Daters, 821 Divisadero Street, San Francisco 17, California.

MINIATURES, Insignia, Flags, Catalogs 35c. Griffin, Gray, A5, 72-05 67th Street, Glendale 27, New York.

WANTED — Cigarette, tobacco cards. Write Charles Bray, East Bangor, Penna.

MINIATURE soldiers: U.S. Marines, American Revolution, Civil War, Custer's Cavalry. Illustrated Catalog 25c. Bussler Miniatures, Dept. E, 40 Howe Street, Quincy 69, Mass.

GROW Giant crystals! Send dime for booklet explaining hobby. Crystocraft Co., College Station, Texas.

MATCHBOOKS for collectors, catalog 25c. Charles Edelman, 1311-P East 84, Cleveland 3, Ohio.

NAZI Insignia. 12 Different, $1.00. Armbands, daggers, flags, medals. Illustrated lists. Medcrafts, 1923 34th St., S.W., Calgary, Canada.

GENUINE Nazi badge 50c; Iron Cross with ribbon, $1.50. 20 different American Emblems, 50c; New Catalog, 10c. Hobbyguild, Box 71 B, Station "A", Brooklyn, New York.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

SURPRISE gift with first roll developed. 8 jumbo superpak album prints or 16 contact prints 40c. 12 exposure roll 50c. Certificate for 3—5x7 enlargements. Dept. B-14, Owl Photo Co., Weatherford, Okla.

FREE 5"x7" introductory enlargement with roll. Finest quality Jumbo dated prints in handy Super paks. 8 exposures 35c; 12, 55c. Globe Photo, Dept. PS, Box 3508, St. Paul, Minnesota.

12 EXPOSURE Rolls, 39c, Jumbo prints. Guaranteed work, one day service. Lincoln Studios, Dept. L, Box 13, Lincoln, Nebraska.

PARTICULAR? 8 Jumbos, 35c; 12—50c. Special: 35mm, 36 exp. $1.25. Flash Foto, Box 36H, Brooklyn 4, N.Y.

FREE Roll Developing. Pay for prints only. Jumbos 4c. Regulars 3c. Failures Refunded. Rush Service. Guaranteed. Square Deal Photos, Hutchinson, Kansas.

8-HOUR service on deluxe jumbo prints. 8-Exposure roll developed and 8 jumbo prints 40c, 12 exposure 55c, 16 exposure 70c; 35 mm. 20 exposure 75c. 36 exposure $1.25. Jumbo Deckledge Reprints 4c each. Contact prints made if specified. Bay Photo Service, P. O. Box 210, Oakland, California.

FREE Mailers, 8 jumbos 40c, 12—55c, 20 exp. $1.00, 36—$1.50. Western Photo, Dept. PS66, Box 298, San Francisco 1, California.

ROLL Developed, 8 beautiful enlarged prints 25c; 12—35c. (Trial) 10 reprints 40c. Quick service. Willard's, Box 2553G, Cleveland, Ohio.

QUALITY Kodak finishing, 8 exposure roll 35c; 12 exposures 50c; 16 exposures 60c. Reprints 4c. Fast service. Guaranteed quality, 40 years continuous operation. Be a satisfied customer. We do color. Send for mailers. Mail Order Photo Service, Box 297, Watertown, Wisconsin.

ENLARGEMENTS heavyweight eight 5x7's or five 8x10's, $1.00. Jack Koons, Huntington Mills, Luzerne County, Penna.

4 X 6 OR 3½ X 4½ oversize glossy prints. 8 exposures 40c, 12 exposures 60c, 16 exposures 80c. Hagner, 1318 West Columbia Avenue, Philadelphia 22, Penna.

32A COLOR PHOTO FINISHING

KODACHROME, 20-exp. processed, mounted, $1.20. Return promptly postpaid. Save money! Get processing by color specialist of world's photographic center. Remit with film, no C.O.D. Mailers supplied free. Send for special offers. Fascolor, Dept. KPS, Box 86, Rochester 1, N. Y.

EKTACHROME—Anscochrome Processed—Mounted $1.00. Fast Kodachrome—Kodacolor Service. Send for Prices. National Color Corporation, Box 55, Northside Station, Atlanta 5, Georgia.

33 MOTION PICTURES, SLIDES SOUND EQUIPMENT

MOVIE Camera Film 8 mm roll $1.50. 16mm 100' $3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

SAVE 50%! Guaranteed-fresh color, b&w movie film! 8mm, 16mm. Free catalog! Eso-H, 47th Holly, Kansas City 12, Mo.

TAPE recorders, tape. Unusual values. Free Catalog. Dressner, 69-02 174 Street, Flushing 65, New York.

FREE Catalogues. 5,000 8-16MM. Films. International Films. Greenvale, New York.

THRILL to slides processed from your favorite negatives. 10 for $2.00. Thirty-five Slides. Green Mountain Falls, Colorado.

HUGE listings, color, B&W sports, comedies, travel, musicals, etc. Catalog 15c. Turke Films, 423 S. Lincoln, Hinsdale 1, Illinois.

TAPE Recorders, tapes; wholesale prices. Korstan, 215 E. 88, New York City 28.

34 CAMERAS, PHOTO SUPPLIES

BASS Says: Quality Cameras Since 1910. When in Chicago visit the Camera Cross Roads of the World . . . or write us for your favorite equipment, new or used. Satisfaction Guaranteed. Bass Camera Co., Dept. AG, 179 W. Madison Street, Chicago 2, Illinois.

BUY wholesale nationally advertised cameras, photo supplies, thousands other products at big discount. Free "Wholesale Plan." American Buyer's, Hertel Station, Buffalo 16-P1, N. Y.

20 TO 50% Discount everything photographic, giftware. Free catalogue. Dart, 3812F Atlantic Avenue, Brooklyn 24, N. Y.

REAL Wholesale Sources. Thousands Nationally Advertised Products. Details Free. Martex, 132-D Nassau Street, New York 7, N. Y.

LEARN Free how to become Glamour Photographer. Make big profits photographing beautiful models. Opportunities nation-wide. No previous experience or expensive equipment needed. Write for Free Illustrated Success Plan. Harrison's, 1031-C Magnolia Park Station, Burbank 9, California.

LATEST 1956 Argus Automatic Projector $42.50. Tremendous Savings. Photo Equipment, Appliances. Free catalog. Camera Shoppe, Box 601-PS, Mt. Vernon, New York.

IDENTIFICATION Card — Freelance Photographers, plus Auto Stickers $1.00. Satisfaction or Refund. Commercial Master, Gardiner 1, New York.

ATTENTION Camera owners. Can you use several hundred dollars? See Polypix ad in "Moneymaking Opportunities."

35 MUSICAL INSTRUMENTS, SONG WRITERS & RECORDS

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted for New Songs. Send poems. Immediate consideration. Crown Music Company, 1472-P Broadway, New York City 36.

FREE Records of your song—Your words —My Melody. Free information. Johnny Mack's Melody Mart, 1094 West 39th Street, Dept. K, Los Angeles 37.

SONGWRITERS: Recording company wants new songs. Royalty basis. National sales, promotion if selected. No charge for melodies. Send material. Music Makers, Dept. G-22, Box 2507, Hollywood, California.

POEMS Wanted to be set to music. Free examinations. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

SONGWRITERS: Music composed and songs arranged by Hit songwriter! Correct procedure explained. Song Service, PS, Indian Lake, New York.

POEMS wanted for musical setting. Send poems. Immediate Consideration. Five Star Music Masters, 646 Beacon Bldg., Boston, Mass.

SONGWRITERS: Song Poems Wanted. $100 Advance royalty paid writer of best song selected each month. Hollywood Tunesmiths, Dept. N, 1609 Vista Del Mar, Hollywood 28, California.

SONGPOEMS and lyrics wanted. Mail to: TinPan Alley, Inc., 1650 Broadway, New York 19, N.Y.

SONGWRITERS Free Booklet Successful Songwriting. Gateway Songs, Box 2470, Hollywood 28, California.

SONGWRITERS! Send poems, songs. Music Service, 243 West 72nd St., PS, New York 23.

POEMS Wanted For New Songs. Send Poems. Free Examination. Immediate Consideration. Songcrafters, Arcade Station, Nashville, Tennessee.

WRITE-A-Tune! Teenagers! Adults! Exciting! Fun! Fame! Amazing Offer! Griscom, (PS), Berkshire V, Sandy Hook, Conn.

SONGS Into $$$$$—Share $29 million dollars yearly for New Songwriters, songpoets. Songs composed, published, promoted by largest firm. Information, appraisal Free. Send to Nordyke Publishing Company, 6000 Sunset Blvd., Hollywood 28, PS. California.

ROSARY. Obtain Its wonderful promises. Pray all three mysteries with Priest and Congregation. Twelve inch long play vinyl recording. Only $1.98 postpaid. Catholic Records, 4130 N. Victoria, Saint Paul 13, Minnesota.

TO $50 for poems! Free editing. 220 markets—greeting cards, magazines. Hobbies, 1603-A Sun Valley, Austin, Minn.

1956 ACCORDIONS — Wholesale. Free catalog. American Accordion Center, PS-6, 5329 Belmont, Chicago.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

WHOLESALE. Recorders. Tapes. Radios. Phonographs. Catalogue. Towers, Box 155, Philadelphia 5.

BUILD 16 Radio Circuits at home, only $19.95 complete. Free Dynamic Radio & Electronics Tester, Set of Tools, Soldering Iron. No experience or additional parts required. A practical Home Radio & Electronics Course. Unconditional Money-Back Guarantee. Order direct or send for descriptive literature. Free valuable Radio, TV & Hi-Fi Repair Manuals on request. Progressive "Edu-Kits" Inc., 497 Union Ave., Room 42A, Brooklyn 11, N. Y.

WALKIE-Talkie. Build wireless two-way portable radiophone for less than $10.00. Plans 50c. Springfield Enterprises, Box 54-A6, Springfield Gardens 13, New York.

FANTASTIC! Exclusive! Sun Powered Transistor Pocket Radio Kit. Uses Famed "Sun Battery" for Power. Complete $6.88 Guaranteed. Headphones $1.95. Catalog. Write, Lektron, 28A Gardner, Chelsea, Massachusetts.

T.V. Signal intensifier makes picture 50% clearer. Installed 5 minutes, money back guarantee. $1.00 Postpaid. Marion's T.V., Parma, Idaho.

CRYSTAL Radio Loud Clear—75c. Thousands sold. Cozzo, 2059 60th Street, Brooklyn 4, New York.

37 BUSINESS OPPORTUNITIES

START A Buying Service, buy wholesale thousands nationally advertised products. Make big profits selling at sizeable discounts. Postcard brings details. American Buyers', Hertel Station, Buffalo 16-N1, N. Y.

ENVELOPES addressed accurately, reasonably. Fast service. We have capable addressers in your city. Glenway System, 5713 Euclid, Cleveland 3, Ohio.

IMPORT-Export! Opportunity, profitable, world-wide, mail-order business from home, without capital; or travel abroad. Established World Trader ships instructions for no-risk examination. Experience unnecessary. Free details. Mellinger, F691, Los Angeles 24.

WE Love our mailman. He leaves over $1,000.00 monthly in our rural mailbox. My college professor husband drafted a scientific home mailorder method. We bought a Texas ranch, live as we always wanted. Now we sell the "Ranch Mailorder Method." Operates anywhere. Inquire: Eveningshade Ranch, Helotes, Texas.

BRONZE Baby Shoes. Instructions, Equipment and mountings for genuine electroplated process. Free catalog. Hollywood Bronze Supply, Dept. B-1, 1624 East First Street, Los Angeles 33, California.

GROW Orchids at home—profitable—fascinating. Year 'round. Mailne to California. No Greenhouse. Gorgeous Cattleyas, Cymbidiums, etc. Successful home grower shows you how. Free—full details. Flowerland, 4622 Wilshire, Los Angeles 5.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

BREED Rare Tropical Fish at home. Earn Big Money! Learn Secrets! Help fill huge demand. Amazing Opportunity! Free Plan. Tropical Fish Breeders, Los Angeles 61, Calif.

NEWEST Spare, Full-Time Home Business. $5 to $10 hour possible. Paint with suede—the finish with touch And eye-appeal. Beautify auto dashboards, signs, radios, toys, figurines, lamps—1001 others. Complete, Step-By-Step Instructions sent for no-risk examination. Free details. Coast, Los Angeles 61.

MINIATURE Trees. Why pay $2.00—$10.00 for growing secrets? Free details. Tiny Trees, Box 3084-S, Chicago 54.

BE appointed state notary public now. Write—Stationers, Helotes, Texas.

YOUR Own name brand business. No investment; no inventory. Part time or full time. Sell famous brands of appliances, housewares, silverware, radios, vacuum cleaners, lamps, tools, clocks, watches, jewelry, etc., etc., over 1,000 items. Join thousands of successful independent dealers. Send for Free catalog and dealer price list. H. B. Davis Corp., Dept. F, 145 W. 15 St., New York City.

FIX Typewriters. Inexpensive home course teaches Factory Secrets. Free Booklet. Write, Typewriter, Tarentum 2, Pennsylvania.

WANT To Make Big Money At Home? $5 profit in an hour possible with Invisible Reweaving. Make tears, holes disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details Free. Fabricon, 8338-S Prairie, Chicago 19, Illinois.

MAIL Order—advertising agency executive reveals sensational no-risk advertising and merchandise methods. Start in office or home—minimum capital—positive profits. Free details; Impact! 2108 Payne, Dept. 2-6, Cleveland 14, Ohio.

WHOLESALE—Get the big merchandise-furniture, appliances, TV's, clothing, tools, auto accessories—most anything. Save half. Literature Free. Associated Wholesalers Service, 1016-C2 Starr, Burlington, Iowa.

ONLY new Moneymaking Plan!! We sell your products. You build luggage and cases at home—we supply instructions—materials—tools—everything. Free details. Casecraft, 807-DG Sunset, Los Angeles 12.

$150 WEEK—easy! Start home Venetian Blind Laundry. Revealing book free. A. V. Co., 101 S. 44th, Philadelphia 4, Penna.

HAVE Home Business! Get $10.00 Merchandise Orders in every mail—Keep $8.00. Everything Furnished. Hutchinson, Box 87-C, Dorchester 22, Massachusetts.

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 178, 2954 Admiral Way, Seattle, Washington.

$1,000 MONTHLY possible in collection agency business. Free details. Write Cole Associates, Syracuse 2, New York.

BRUSH Plating Outfits for plating articles in the home and shop. No tanks necessary. Good income spare or full time. Free particulars. Gunmetal Co., Ave. E, Decatur, Illinois.

REAL Wholesale Sources. Thousands Nationally Advertised Products. Details Free. Martex, 132-E Nassau Street, New York 7, N. Y.

$70 WEEKLY—Home, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757D, Los Angeles 34.

YOU can Make Money at home in spare time taking magazine renewal subscriptions. No capital or experience necessary. All supplies furnished. Write Today! McGregor Magazine Agency, Dept. 510B, Mount Morris, Illinois.

MAKE Profitable Products — Catalogue Free—International, 6347 Parnell PS-6, Chicago 21, Illinois.

BUY Wholesale! Resell At Big Profits. Brand name merchandise — Appliances, cookware, housewares, watches, jewelry, dry goods, clothing, sporting goods, toys, gifts, etc. Free 124 page illustrated color catalog with confidential cost sheet. Merit Home Products, Dept. PS-6, 107 Manhattan Ave., Brooklyn 6, New York.

IMPORT your own products in small lots. Also, start profitable mail order business using International Dropshipment method. Capital unnecessary. Free details. Ga. Overseas Trading Co., Dept. D.3, 715 Persons Bldg., Macon, Georgia.

"I earn $400.00 a week." I've learned an amazing new method of printing, colorful signs, banners, cards, posters, glassware—anything. No printing press or other expensive equipment is necessary! Big Money-Making opportunity for anyone. Write for my secret and Revealing home-business plan—you'll be amazed! Mr. Anderson, Screen Print Company, PS-6, Los Angeles 61, California.

METALIZE Baby Shoes, jewelry, gifts. Free Catalog. Kiktavi, Box 73136, Los Angeles 3.

"HOW to Start a Business" booklet sent Free! If you Know any Trade—go into business for yourself! Learn the 9 easy steps to follow. We've guided 5,000 others to success. Revealing Free Booklet yours for the asking! Write! National Business Consultants, Office AJE, Los Angeles 61, California.

BE Your Own Boss. Inside information how hundreds successful businesses started. Free booklet. Carmillo Products, Dept. P.S., La Mesa, California.

POPCORN and Potato Chip Equipment. Eakins, Box 933-B6, Springfield, Ohio.

"HOW to make money with carnival games." 144 page book. 35 illustrations. Enormous profits possible full or part time. $2.00 postpaid. The Fox Company, 1296 Yosemite, San Jose 26, California.

AMBITIOUS? We establish you in your own business, supply catalogs, circulars, etc., ship orders under your name, paid or C.O.D., show you exactly what to do. Household items needed in every home. Sell direct, by mail or through agents. Catalog, plans, details absolutely free. Write Topval Corp., Lindenhurst 621, N.Y.

WHOLESALE Catalog! Nationally advertised tools. 15-50% Discounts! Tool Discount House, Paterson 9, New Jersey.

ADVERTISING book matches—Cash in on big demand—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash Commissions. Superior Match Co., Dept. PX-656, 7530 Greenwood, Chicago.

AMAZE Friends. Rapid Mental Multiplication. Free lesson shows how. Math Institute, Box 204, Mobile 3, Ala.

EXTRAORDINARY Business opportunities via inexpensive self-teaching capsule course "Air Conditioning Simplified". Free particulars. Kowalski, 208 East Main, New Britain, Conn.

WHOLESALE—Luggage. Leather Goods. Write, Midtown Distributors, Box 1656, Worcester 7, Mass.

EARN Money At Home By Mail. Revealing Booklet Tells How. Only 25c. Satisfaction Guaranteed. L. C. Sales, 17 South 9th St. Wilmington, North Carolina.

TRUTH about mail order opportunities! Make money by knowing the do's and don'ts! Get the benefit of our research and testing of current propositions. Save time, money, and disappointments. Send $2.00 for "Current Facts". Sources of 32 good mail order products included free. Flanagan, P.O. Box 4341, Sacramento, California.

REFLECTIVE Sign Letters, Ornaments. Free Samples. E-Z-On Sign Letters, Pell Lake, Wisconsin.

25c BIG Mail, New Sales opportunities. "Dahle", Box 7B1, Omaha 10, Nebraska.

TIN-Cans. Turn them into cash. (Thirty methods). Sawdust (seventy methods). Newspapers (eighteen methods). Instructions 50c each. All three $1.00. Charles Company, 12-EXT, Norwood, Ohio.

MINK Raising information free. Complete. Lake Superior Mink Farm, Superior E E5, Wisconsin.

HOW and where to obtain Capital? Free details. Star Service, Wapakoneta, Ohio.

HIGHEST commissions all magazines. Free catalog, supplies, prizes exclusive services. Subscription Service Company, Dept. D, Box 2070, Birmingham, Alabama.

SELL "Political Greeting Cards". Something brand new. Tasker, 105 East Custis, Alexandria, Virginia.

SPECIALIZED Magazines give you new ideas. Examine current copies, one or all those covering your field. 5,166 different publications—all businesses, trades, vocations, professions, sports, hobbies, etc. Free List. Write today. Commercial Engraving Publishing Company, 34S North Ritter, Indianapolis 19, Indiana.

DOLLARS: Baby record books, Kitty Kat shoes. My Baby albums. Eleven Thousand new prospects daily. Sold by mail. Use our literature. No-Co-Ro, Capitola 8, California.

TO $100.00 weekly. Sparetime, home operated mailorder business. Successful "Beginner's" plan. Everything supplied. Lynn, 10420-C National, Los Angeles 34.

LIQUID Rubber. Make flexible molds. Free Sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

WHOLESALE catalogue! Appliances, cameras, watches! Cam Company, 6806PS-20th Ave., Brooklyn 4, New York.

A Monthly repeat business which you can operate in your own community. For the average working man. For free details write Grasek, P.O. Box 494, McKeesport, Pennsylvania.

OPPORTUNITY to earn $15,000-$30,000 annually. Franchise protected. Granted on $12,500 guarantee. Live at home. No merchandise to buy. Selfemployed. One of most exclusive and noncompetitive Businesses in United States and Canada. Send for free explanatory booklet. Harrell and Company, Box 8-D, Louisville, Illinois.

FRANCHISE opportunities nationwide! Profitable distributorships, dealerships, agencies. Request interesting information immediately. National Franchise Reports, 333 North Michigan, Chicago 1.

BIG Profits Raising Fishworms and Crickets. Free Literature. Carter Worm Company, Plains, Georgia.

SAVE 20% to 50%. Buy wholesale! Nationally advertised merchandise. Free details! Beecher Sales, Box 2161-E, Cincinnati 1, Ohio.

"MAILORDER Laws and Regulations". Discusses federal, state, local licenses, necessary taxes, legal requirements governing mailorder businesses. $1.00. "Mailorder Rules for Beginners". Additional helpful information. $1.00. Play Safe. Order both. Tasker, 105 East Custis, Alexandria, Virginia.

MAKE flexible molds. Cast figurines, plaques. Free sample. Tooker, 630-A Chestnut, Hamilton, Ohio.

PLASTERCRAFT molds, liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Jayhawk Plasters, Blue Rapids, Kansas.

REBUILD batteries; Make rubber stamps; Repair dolls. Catalog "60 ideas" free. Universal, Box 1076-B, Peoria, Illinois.

WORK at home. Make money. Amazing opportunities. Free details. Larken Coleman, Box 821-S, Newark 1, New Jersey.

NATURAL molding rubber, extra thick. Free sample. W. Wooley, 115-B, Donald, Peoria, Illinois.

$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-36C, Oceanside, California.

MAKE tough, attractive building plastic, easily. Build better for less. 800% profit. Exclusive district. Bays Laboratory, Oklahoma City 9.

OPERATE restaurant or diner. Free booklet reveals plan. Write Restaurant Arts, BU-46, Fremont, Ohio.

FREE Folio "$5,000-$45,000; Unlimited Vacations." No merchandise, equipment. Unknown! Work home—sparetime! Haylings—S-16, Carlsbad, Calif.

WANTED: Salesmen, Agents, Mailers. New Farm Item. Good Commission. Repeat orders. Sell stores, direct, by mail. Details, sample selling literature. Nelson Sales, Elkhorn 12, Nebraska.

MAKE $3 An Hour Sharpening Scissors. Details free. Fiorn, 3741 Rufe Snow Dr., PS, Fort Worth 11, Texas.

VENDING machines—every description. New or used. Lowest prices. Start a route or sell outright. Mack Postel, 2952 Milwaukee, Chicago 18.

BEAUTIFUL Feather Bird Pictures, with hand carved cedar frames; Profitable. Sample $1.00. Robert Celaya, Brownsville, Texas.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, "Minnesota."

MONEY in new greaseless doughnuts. Start in kitchen. No smoke. Sell stores. Free recipes. S. Ray Co., 3605 South 15 Ave., Minneapolis 7, Minn.

PLEASANT Profits—Let us show you how to start your own complete scissors and tool sharpening business. Free details. Serr-Edge Inc., 9733 Lorain, Cleveland 2, Ohio.

$250 WEEK cleaning venetian blinds. Patented Machinery. Free literature. Robinson, 7213A, Indianapolis 1, Indiana.

$100-$400 MONTHLY Possible, addressing envelopes, postcards, from mailing lists at home. Longhand, typewriter. Detailed Instructions only 25c! P. Economy, Rowley, Mass.

$26,500 SALES in two weeks! Amazing radio-mail order method. Free details. Broadcast Service, 1412-JB Great Northern Building, Chicago 4, Ill.

RARE opportunity for men in country and small towns. New company with Proved Plans that make you bigger profits. Write "Fire King," Dept. 23, Littleton, Colorado.

MAKE Big Money! Repair porcelain enamel on all appliances. Much needed service. Start full or part time business for less than $30.00. Free information. Porcelain Enamel Repair Service, 422 Prospect, Buffalo, New York.

FREE! Circular "Unlimited Opportunities". Dynamic, 3 Laurel Drive, Ansonia, Connecticut.

$46.00 FROM Square Foot Plywood; Jigsaw necessary. Details Free. Woodarts, Bridgewater, Mass.

WHOLESALE Name Brands Illustrated Catalog $.35. (Refundable). Laconia, Box 6014, Bridgeport 6, Connecticut.

OPERATE Profitable Mail Order Business! Splendid Opportunity. For details write: Thomas Bond, 1637-D West Vernon, Phoenix, Arizona.

MANUFACTURE Successfully! Fortunes made daily. Free Booklet. Alltools, Box 268-CE, New York 5.

97 SCHEMES To make a million. You might! Information free. R. & S. Distributors, 19 Emory Street, Jersey City 4, New Jersey.

NEW Mailorder opportunity! Profitable. Information. Bradley, Box 135, Madison 1, Wisconsin.

YIPPEE!! I've got a patent that ain't for sale. Big Manufacturer superfluous. One person can mass produce 600 of my product per week. Fun. Easy. Sell fast $1. each. Room for you too. John Massey, Box 898, Turlock, California.

LEARN home mailorder. Fascinating, profitable. Free details. Bureau, 107-B Rounds, Buffalo, New York.

FINANCE your own business. Expand! Know—"How and Where to Raise Capital." Free details. Advance Publishing, Box 1377-PF, Miami 8, Florida.

UNLIMITED Earnings at home! Your own agents supply business, shoestring investment! Noted specialist says: "Most outstanding deal in 18 years." Write Maxson, Falls Church 25, Virginia.

WORLD-Wide! Import-Export Business from home without capital. Receive beautiful samples; gifts from abroad! Experience unnecessary. Free Information. Weyman, (C-166) 939 Vanderhoeven, San Antonio 9, Texas.

WHOLESALE Prices on 800,000 items. Many nationally advertised brands! Buy at big discounts. Free confidential information—mail postcard today. Glass Publishing Company, Ellwood City 1, Penna.

BUY Wholesale! Sell for profit. A postcard will bring our Free catalog listing nationally advertised toiletries, drug sundries, notions, novelties, closeouts, etc. Atlas Sales Company, Dept. P.S., 1141 Broadway, New York City.

WHOLESALE catalogue! Appliances, cameras, watches. D'Auria, Box 355-PS, Jackson, Michigan.

UNUSUAL mail orders ideas, products, projects, sources. Authentic information, guidance. Free details. Write: Fax, Box 1024-A, Galveston, Texas.

WHOLESALE Buyers' Service! Buy Nationally advertised Merchandise wholesale. Sell way below retail. Fabulous profits. Write Wholesale Buyers, Box 22-SE, St. Louis 3, Missouri.

DISCOUNTS 20-50%, thousands nationally advertised products; own use; sell others at big profits. Postcard brings free information. National Wholesale Service, Dept. M, Box 397, Buffalo 5, New York.

TOPFLIGHT specialist shows how to start a profitable mail order business. Convincing booklet free. Eisert, 2119 Sansom, Box 36, Philadelphia 3, Pa.

YOUR own Wholesale waterless hand cleaner business, free instructions, Easy Life Manufacturing, 12906 Estelle Road, Silver Spring, Maryland.

YOUR Own Business . . No Investment . . No Inventory. Sell Name Brand nationally advertised items. Free Catalog. Confidential Wholesale Price List. Normandy Dist. Co., Dept. PS, 133 Fifth Ave., N. Y. 1, N. Y.

37A CLAIM INVESTIGATORS

INVESTIGATE Accidents—Earn $750 to $1000 month. Thousands of insurance companies, airlines, and steamship lines urgently need Claim Investigators. We train you at home spare time. Placement counsel and help. Free book—Now! Universal Schools, 6801 Hillcrest, B6, Dallas 5, Texas.

38 MONEYMAKING OPPORTUNITIES

START A Buying Service, buy wholesale thousands nationally advertised products. Make big profits selling at sizeable discounts. Postcard brings details. American Buyers', Hertel Station, Buffalo 16-01, N. Y.

WIN contest money. General Contest Bulletin gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

LEARN Technical Metaphysics and insure your future. Easy, inexpensive correspondence course. Simplest method known. Diploma. Write: Premier College of Technical Metaphysics, 2532 McKenzie St., Vancouver 8, B.C., Canada.

MAKE Spare Time Money preparing and mailing sales literature. Adams Surveys, 3513-AS Sunset Blvd., Los Angeles 26, California.

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 179, 2954 Admiral Way, Seattle, Washington.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write. Wagoner, P-125 West 86th. New York 24.

SELL Titania Gems; far more brilliant than diamonds. Catalog free. Diamonite, 2420-S 77th, Oakland 5, California.

$25 WEEKLY possible, sparetime, addressing envelopes at home. Temple Co., Muncie 7, Ind.

$150 WEEK—easy! Start home Venetian Blind Laundry. Revealing book free. A. V. Co., 101 S. 44th, Philadelphia 4, Penna.

SPARETIME Addressers make $25.00-$50.00 Weekly. Details free. Glenway, 5713 Euclid, Cleveland 3, Ohio.

ENVELOPE addressing facts—extra income opportunities revealed thru HM service. Free details. House of Maxwell, Dept. 44-6, Wooster, Ohio.

NEW General, Religious, Comedy 7"x11" Signs—cost 7c, sell 50c. Sample free! Lowy, 812 Broadway, Dept. 929, New York 3.

WHOLESALE — $100,000 Merchandise. Large Illustrated Catalog 25c. Deane's, Box 40-P, Elberton, Georgia.

500 WAYS to make money at home. Literature. Herbert Stanley, 863 Martin Avenue, Bryn Mawr, Penna.

500 MONEY Making Ways $1.25. Royal Service, Box 3201-C, Denver, Colorado.

FORTUNE Possible raising fishworms and crickets. Free Information. Carter Farm-11, Plains, Georgia.

PRINTING. Office Supplies wholesale. Save 50%. Royal, Box 368-S, Cleveland 27, Ohio.

BIG Profits stamping social security plates. Catalog free—General Products, 188PS1 State, Albany, New York.

THOUSANDS of Moneymaking tips, home profit Plans! Free Folder! Synco, 1844 Drollinger, Wichita 18, Kansas.

FREE Book "505 Odd Successful Businesses." Work Home! Expect something Odd! Pacific-35c, Oceanside, Calif.

PROFITS Home Magazine Mail Business. Details 25c. Palm, Box 1221, Baton Rouge 5, La.

FREE Folio "$5,000-$45,000; Unlimited Vacations." No merchandise, equipment. Unknown! Work home—sparetime! Haylings—S16, Carlsbad, Calif.

SUCCESS does not result from luck, but from following certain procedures. Be sure of success before you start. It works for anyone. Send Quarter for formula. Malique, P.O. Box 3892, Columbus 13, Ohio.

EVERY opportunity seeker needs Plan Digest. Monthly newsletter. Details, M. Harry, 68 Woodfern, Scarboro, Ontario.

21 POPCORN, Candy apple formulas, proven money-makers. Send $1.00 today for formulas, catalog money-making ideas. Concession, 3920 Secor, Toledo, Ohio.

MONEYMAKING Opportunities 10c. Popular, Box 101, Hamilton, Ohio.

500 WAYS to earn money at home, details 10c. Specialties, Box 413B, Springfield, Illinois.

$60.00 FROM 1 Bundle Shingles. Plans—Details $1.00. R. Stecher, 507 Bell Street, Indianapolis 2, Indiana.

HOME Mail Earnings for you; new Manual "10 Mail-Selling 'Information' Methods" reveals proven system only $1.00 postpaid. Hamm, 3001 North Spaulding, Chicago 18, Illinois.

$1,000 MONTHLY Possible raising Redworms; Large African Nightcrawlers! Backyard, Garage, Basement. Illustrated Booklet explains raising, packing, marketing. 25c postpaid! Ozark Worm Farm-v, Willow Springs, Mo.

GET into your own big paying weatherstrip business. —E-Z-On— 35, 1009 Harvard, Evanston, Illinois.

MAKE rosaries. Free instructive catalog. Murphy and Spratlin Company, Box 419P1, Pittsfield, Massachusetts.

SELL Yourself—sell neighbors, Aluminum awnings—Beautiful Baked Enamel Colors—All sizes—factory prices! Write "Groff," Box 10254, Tampa, Florida.

WORLD'S best sparetime moneymaking opportunity! Write: Mozelle Service, Bonham, Texas.

YOUR own business. Operate from home. Very profitable, dignified. Write Box 626-A, Glen Ellyn, Illinois.

BUY Wholesale direct! Western States, Save 40% freight charges Appliances, Housewares, Tools, Toys, Sporting Goods, Jewelry. Large Catalog $1.00. Refundable! General Wholesalers, Box 3058F, San Francisco.

BUY Wholesale! Save 66-2/3%! Appliances, Furniture, Jewelry, Toys, Sporting Goods, Tools. Free Catalogs. National Buyers Service, Box 3338FB, San Francisco.

MAKE money addressing. Literature free. Pithon, 8007 SE 65, Portland, Oregon.

PIANO Tuning Pays. Learn this profitable profession at home easily with patented Tonometer and mechanical aids No knowledge music necessary. Diploma granted. Write for booklet. Niles Bryant School, 3731 Stockton Blvd., Dept. S, Sacramento 20, Calif.

MAKE Money with your camera. Amazing new low cost color enlargements can bring you hundreds of dollars in spare time. Nothing else like it! Send 10c for samples and eye-opening facts. Dept. PS-6. Polypix Co., 723 S. Wells, Chicago 7, Illinois.

MAKE $100.00 weekly mailing catalogs. Cash commissions paid. Products, 2342 Washington, Chicago 12, Illinois.

38A BUY IT WHOLESALE

WHOLESALE Catalog! Nationally advertised tools. 15-50% Discounts! Tool Discount House, Paterson 9, New Jersey.

BUY Wholesale. Famous brands. Catalog 25c. Golden Feather Service, 1061-A Atlantic, Long Beach, Calif.

BUY Wholesale! Large Illustrated Catalogue! 25-75% Discounts! Nationally Advertised Products. Appliances, Housewares, Clothes, Jewelry, etc. Send $1.00 Refundable. J. P. Frank Co., 1856 Blue Island Ave., Chicago 8, Illinois.

WHOLESALE Catalog! Appliances, cameras, watches. Postcard: Selbyco, Decatur 269, Illinois.

ELECTRIC Guitars, amplifiers, accordians, wholesale. Free catalog. Carvin, PS287, Covina, California.

BUY Wholesale popular brands. Catalog $1 refunded 1st purchase. Luk Associates, Box 561, Salem, Mass.

FREE Illustrated Wholesale Catalog—Savings up to 50%! Marpat, Box 1485, D-JPSM, Milwaukee, Wisconsin.

38B IMPORT-EXPORT

JAPAN Trade Guide, 1956 Edition, just out May 20th! Importers—Exporters currently showing tremendous profits! Manufacture your item in Japan. Contains over 700 pages including latest individual Japanese industrial surveys, import-export regulations, shipping, patents, etc., plus comprehensive mercantile directory. Published in English by Japan's leading financial press under direct supervision of Japanese Government. Price $10.75 U.S.A. Send for free illustrated brochure and literature. Japan Trade Guide (PS), Box 3452 Terminal Annex, Los Angeles 54, California.

39 FORMULAS, PLANS, ETC.

HOW to make more money with formulas. Free details. Formulco, 4015 So. Lincoln, Englewood 3, Colorado.

HOT Water from the sun. Plans 50c. Solar Industries, Box 25, Healdsburg, California.

MILLER'S Modern manufacturing formulas make fastest-selling products that get the business and pay! Fifty years supplying the best. Valuable Literature free! Miller, Chemist, 1517-C, Tampa, Florida.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Ill.

40 PLASTICS

PLASTICS home-craft course for Men and Women. Tells and shows how to make hundreds of fast selling plastics products. All plastics and materials for 23 projects included in course. No special tools needed. Course pays for itself. Write for Free booklet. Interstate Training Service, Dept. D-2, Portland 13, Oregon.

PLEXIGLAS—Cut to size—Clear—Any thickness — Colors — Rods — Tubing. McClarin Plastics, P. O. Box 168B, Hanover, Pa.

PLEXIGLAS, Lucite. Square foot cost. 1/16"—$1.15; 1/8"—$1.52; 3/16"—$1.86; 1/4"—$2.21; 3/8"—$3.23; 1/2"—$4.36. Colors 10% additional. Send 15% for postage. Aristocrat Plastics, 23-25 Sussex Ave., Newark, New Jersey.

LAMINATING Supplies. Price List Free. Solomson, 46 Cornhill, Boston 8, Mass.

PLEXIGLAS, Fiberglas, Polyester, Acetate. Unique wholesale-retail catalog—15c. Gem-O'-Lite, Box 686S, North Hollywood, California.

NEW Liquid Casting Plastic, clear, colors. Embed real flowers, insects, photos, coins. Saw, drill, carve. Send 25c for handbook "How to Cast with Liquid Plastic" and proved success plan showing how to make money at home. Castolite, Dept. G-102, Woodstock, Illinois.

41 CHEMISTRY & PHYSICS

HOME laboratory and apparatus kits. Laboratory supplies. Catalog 25c. Established 1931. John H. Winn, 124B West 23rd Street, New York, N. Y.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology 20c. Tracey Laboratories. Evanston, Illinois.

SPECTROSCOPE for quick chemical analysis. $3.00. Cutting Sons, Los Altos, California.

CHEMICALS and apparatus for industrial, analytical and private laboratories. Catalog 25c. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N.Y.

BOOKLETS: 60 pages each! "Beginners Chemistry," "Chemistry," "Einstein's Relativity," "Physics," "Atomic Theory," "Electron Theory," "Scientific Oddities," "Light," "Sound," "Heat," "Electricity," "Radio," "Astronomy," "Useful Tables," "Geometry," "Mathematical Oddities," "Scientific Terms." (Order by Titles) 10c each. Franks, 3121 South Racine, Chicago 8.

EXPERIMENTERS: Terrific Bargains catalog—20c. Hagenow Laboratories, 2414 Clarks, Manitowoc, Wisconsin.

AMAZING New Book of Science. Experiments, Formulas and Catalogue of Laboratory Supplies. Only 25c. National Scientific Co., Dept. PS-6, 500 W. Road, Lombard, Illinois.

CHEMICALS, Supplies. Catalog 25c, refundable. Laboratory Sales, Box 161-P, Brighton, Mass.

42 HELP WANTED

FOREIGN Jobs—Latin America, Alaska, Canada, up to $1500 monthly. Up-to-date 1956 Foreign Service Directory gives complete information; hot list of firms hiring for Military and Civilian Construction, Aircraft, Oil, Exporters—Importers, Mining. $1.00. How-When-Where to apply. 9th Successful year! Global Reports, Box 883-P, Hollywood 28, Calif.

FRENCH Foreign Legion. Action hungry men! Enlistment procedure, papers. 50c. Legion Information, Box 483, Joplin, Missouri.

FOREIGN and American Employment!! High Pay. Overtime Work. Transportation expenses. World-wide Opportunities for skilled—unskilled. Most all Trades, Carpenters—Electricians—Truck Drivers—Mechanics. Many Others. Latest Guaranteed Reports, application form. How—When—Where to apply. Also Oil—Aviation — Steamship contacts. Guaranteed Satisfaction or Money Refunded. One-year registration—advisory service. Reports mailed same day order received!! Send $2.00 or C.O.D. plus postage. Act today and receive Bonus Report on St. Lawrence Seaway Project. Midwestern Services, Box 124, St. Louis 5, Missouri.

JOBS Paying To $350 weekly now available on overseas and American projects. Men and women. All trades. Transportation paid. Free information. Write Transworld, Dept. P6, 200 W. 34th St., New York, N. Y.

JOBS on ships! Experience unnecessary. Employment information. Transoceanic, Box 494-W, Baltimore 3, Maryland.

AIR Capitol Wichita complete Sunday classified section $1.00. Adcraft, 237 S. Custer, Wichita, Kansas.

AIRMAILED Ad Sections. Six California industrial areas $5.00, or $1.50 each. Newservice, 2700 Dana, Berkeley, California.

SAN Francisco complete Sunday classified supplement. Air Mailed. 75c. Arnold, 477 Mastick, San Bruno, California.

FLORIDA jobs galore! Contacts, $2.00. Hayward Parker, 1737 Cortez Rd., E., Jacksonville, Florida.

"FOREIGN, Alaskan, USA, Job Opportunities!!" Earn to $1500.00 Monthly. Million Americans Employed Overseas! Who to contact for highest paying jobs. Laborers—Trades—Truck Drivers—Equipment Operators—helpers—Clerks—Engineers—Many Others. Also Aviation, Oil, Travel. Over 52 Countries—St. Lawrence Project, Spain, Latin America, Northern Projects, Europe, Pacific, Etc. Year Registration—Advisory Service. Unconditional Money-back Guarantee! $2.00 Postpaid. $2.25 Airmailed. (COD's Accepted). International Reporter, St. Louis 1-SG, Missouri.

PHOENIX & Tucson Job Listings $1.00. 2922 E. Adams, Tucson, Arizona.

FREE Folio "$5,000-$45,000; Unlimited Vacations." Work home—sparetime. Haylings—HWS, Carlsbad, Calif.

INFORMATION pertaining to construction projects and employment in foreign countries and U.S. Good Pay. Mail $1.00 to Employment Information, 412(M) Albee Building, Washington 5, D.C.

43 AGENTS WANTED

EVERY man a prospect. Request free sales kit. Show line of belt buckles, individualized with prospect's personal name and emblems also transportation, police, fireman badges. Choice 3,000 emblems. Hook-Fast, Box 1425-PS, Providence, R. I.

YOUR own business—Suits $1.50; Overcoats 65c; Mackinaws 35c; Shoes 12½c; Ladies' Coats 30c; Dresses 15c. Enormous profits. Catalog Free. Nathan Portnoy Associates, 605-J West 12th Place, Chicago 7.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 431-E North Clark, Chicago.

GOLD or Silver letters, numbers. Windows, Doors. Trucks 1" to 6" 500% Profits—Free Samples. Atlas-U, 544 West 79th, Chicago 20.

START Your Own Business On Credit. Your own boss. 1598 Dealers sold $5,000 to $32,000 in 1955. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant profitable business backed by world-wide industry. Write Rawleigh's, Dept. F-U-PSC, Freeport, Illinois.

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 850 N. Dearborn, Dept. 18, Chicago, Illinois.

BUY Wholesale thousands nationally advertised products at big discounts. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-Li, N. Y.

GOLDMINE Of 600 money-makers. Copy Free. Specialty Salesman Magazine, Desk 6-B, 307 N. Michigan, Chicago 1.

BIG Money-making opportunity. Exclusive line work uniforms. Jackets, pants, shirts, coveralls. Advertising embroidered. Every business prospect. Outfit Free. Master Div., 675 Water, Ligonier, Indiana.

FREE! Beautiful Feather Pictures 200% Profit! Apartado 9036, Mexico 1, D.F.

MEN—Women Agents: Sensational new moneymakers — Beautifully hand-painted plastic personalized photo enlargement, compacts, rings, bracelets, lockets, etc. Simply take orders, pocket 40% commission—we deliver and collect. Sales outfit free. Novelco, 3343 North Avenue, Chicago 47.

WHOLESALE Catalog! Nationally advertised tools. 15-50% Discounts! Tool Discount House, Paterson 9, New Jersey.

CALENDARS, Advertising Novelties, Matches. All styles, including Religious. Varnished 12 sheet. Girls. Hundreds of Advertising Novelties, Book Matches, etc. Fleming Calendar Co., Promotional Division, 6539 Cottage Grove, Chicago 37, Ill.

MOORE Made $9.00 In An Hour . . . selling farmers. Hundreds of salesmen making good money full time or spare time with 3 leading poultry magazines welcomed everywhere. No investment or experience needed. Powerful sales kit free. Poultry Tribune, Box 566, Mount Morris, Illinois.

NEW Product Trial—No Investment. Arrow Novelty, Box 144, St. Catharines, Ontario, Canada.

WILL you wear new suits and topcoats without one penny cost and agree to show them to friends? You can make up to $30.00 in a day even in spare time, without canvassing. W. Z. Gibson, 500 South Throop St., Dept. T-626, Chicago 7, Illinois.

$6.73 PROFIT On Every Sale Of Lightning Portable Adding Machines, retail $14.95. Write now for free colored photo, full details. Lightning Adding Machine Sales Co., Dept. C, 2306 W. Slauson Ave., Los Angeles 43, California.

HOUSEWARE Specialties that sell on sight. A must for every kitchen. Most practical items in beautiful colors, sells on demonstration. Write for details. Jahn, P.O. Box 8, Dept. PS, Park Ridge, Illinois.

$60 WILL earn $10,000. Long needed invention. Proved sales plan. Send no money. Details free. Write Cyclo, Dept. 132, 3816 Dahlia, Denver, Colorado.

60% PROFIT on cosmetics—Famous nationally advertised Hollywood Cosmetics pay 60%! Make $25.00 day up! Hire others. For free samples, details, write Studio Girl, Glendale, California, Dept. 1166G.

EASY money selling Fire Extinguishers. 110% Profit. Better Products, Box 454B, G.P.O., Brooklyn 1, New York.

CALIFORNIA sweet smelling beads, sensational sellers. Particulars free. Mission, 2328-P West Pico, Los Angeles 6, Calif.

FREE book "505 Odd, Successful Businesses." Work home! Pacific-38C, Oceanside, Calif.

BIG profits! Sell miracle "No ring" spot remover in stick form. Non-inflammable. Guaranteed. Free details. M & M, Dept. 1-PS, 842 Third Avenue, New York.

NEW magic metallic ironing board cover. Sells on demonstration. Send for Free sample. Take Orders immediately. Quality Products, (Dept. B), Box 749, Passaic, New Jersey.

USED and new watches. $2 up. Free List. Southern Watches, Gray, Georgia.

BIG profits, selling ties ($2.00 value) $6.50 dozen. Free catalog. Empire Cravats, 611-PS Broadway, New York 12.

EASY handwork makes fast-selling articles. Sample free. Sunmade Company, Brockton 64, Massachusetts.

UP To $200 weekly selling amazing puncture proofing compound. Terrific seller. Big profits. Free details. M & M, Dept. 2-PS, 842 Third Ave., New York.

POWER Mowers—$39.00. Delivered. Sales Kit—Free. Rotacut-52, Excelsior Springs, Missouri.

MAKE Extra Money. Sell front door name plates to friends, neighbors. Retail $1.98—you make $1.00! Free selling kit. Modern Engraving Co., P.O. Box 194, Boston 14, Mass.

NEW Household item, tremendous market, fast seller, big profits. Send for details and free sample offer. M & M, Dept. 4-PS, 842 Third Ave., New York.

$1.00 PROFIT selling $2.95 photo enlargement offer. Allen Studio, Reigler Bldg., Little Rock, Arkansas.

BUY Wholesale! 100,000 Name Brand Products! Save 66-2/3%! Big profits selling others spare time! Free Catalogs. National Buyers Service, Box 3338FE, San Francisco.

44 HIGH-GRADE SALESMEN

AD Matches! Sell amazing designs—10, 20, 30, 40, and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part time. Buy nothing! Sales kit furnished. Match Corp., Dept. PS-78, Chicago 32, Illinois.

ADVERTISING book matches—Cash in on big demand—sell Union label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-656, 7530 Greenwood, Chicago.

FASTEST selling repeat product. Tremendous demand. No competition. Highest earnings. Write. Don't miss this. Forrest Products, 719 Fisk, Piqua, Ohio.

USED and new watches. $2 up. Free List. Southern Watches, Gray, Georgia.

45 EDUCATIONAL & INSTRUCTION

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

BE a Real Estate Broker. Study at Home. Write for Free book today. GI approved. Weaver School of Real Estate, 2018R Grand, Kansas City, Mo.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

COMPLETE Your High School at home in spare time with 59-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. XA46, Drexel at 58th, Chicago 37, Illinois.

STUDY For Doctor's degree of Psychology, Metaphysics and Divinity. Correspondence courses only. College of Divine Metaphysics, Dept. P-S, 2811 North Illinois, Indianapolis 8, Ind.

EARN While You Learn Auto And Diesel Mechanics. Master this top paying trade. Many graduates earn $100 a week and up. Approved for Korean veterans. For free information write Dept. No. 262, Nashville Auto-Diesel College, Nashville 3, Tenn.

QUALIFY for college equivalency degrees. Increase opportunities for promotions, better pay. No courses. Bulletin 10c. Cramwell Institute, Adams 7, Mass.

HIGH School diploma at home. Licensed teachers. Approved materials. Southern States Academy, Box 144 PX, Station E, Atlanta, Georgia.

WANT A Diesel Job? New Opportunities to increase income. Higher Pay, More Money. We can help you Qualify. Tools Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division. Interstate Training Service Dept. B-2, Portland 13, Oregon.

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 180, 2954 Admiral Way, Seattle, Wash.

BLUEPRINT Reading—train at home. Learn to read blueprints with confidence in 10 easy lessons. Write today. Belton School, 1059-R North Lawndale, Chicago 51.

HIGH School—No Classes. Study at home. Spare Time. Diploma awarded. Write for Free Catalog HBA-56, Wayne School, 2527 Sheffield, Chicago 14, Illinois.

SIMPLIFIED analytics teach algebra clearly, instantly. $1.00, guaranteed. Ziemba, I-6123 Orchard, Dearborn, Michigan.

BECOME a Doctor of Psychology, Divinity or Philosophy in Metaphysics. Learn the secret of contentment, happiness. Write for Free Booklet. Correspondence Courses only. College of Universal Truth, 23-A East Jackson, Chicago 4, Ill.

HAND Engraving. Learn at home. Write Box 116, Mishawaka, Ind.

ENGINEERING Degrees earned by home study. American College of Engineering (University of the West), Box 27724 (A), Hollywood 27, Calif.

WELDING training pays at Hobart Welding School. Box P-661, Troy, Ohio. VA contract. Best equipment. Catalog free.

CONFIDENCE! Strong 10 Lesson Course. First Lesson $3.00. Ritterby, 660 Pinecrest, Holland, Michigan.

EARN Degree. Free Bulletin. Home-study only. Midwestern Bible School, 517 Merchants Bank Bldg., Indianapolis.

PHYSICAL Therapy and Massage—We Train You At Home. Earn Big Profits from your own Private Practice or Work with Hospitals and Doctors. Free Catalog. National Institute, Desk 3, 159 East Ontario, Chicago 11.

PIANO Tuning pays. Big money in spare time. Learn at home in 30 days. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. Free catalog. Capital Tuning School, 18 Southwest Second, Fort Lauderdale, Fla.

EARN College degree. Remain employed. Fremont College, 915-s Grandview, Los Angeles 6, Calif.

WANT Strong, masculine voice? Send for Free booklet. Prefect Voice Institute, 210 South Clinton, Studio 2FU-1, Chicago 6.

U.S. Civil Service Tests! Training until appointed. Men-Women, 18-55. Start high as $377.00 month. Many jobs open. Qualify Now! Get Free 36-page illustrated book showing salaries, requirements, sample tests. Write: Franklin Institute, Dept. T-22, Rochester, N. Y.

MENTAL telepathy is now plausibly explainable by simplest electronic principles. 10,000-word serious treatise, with precise suggestions for practicing. $5.00. Refunded if dissatisfied. Since practicing telepathy on people I've prospered fantastically; received two cash gifts: $5,000. Fun anyway, and if it works, you're rich. John Crehore, Walpole, New Hampshire.

LEARN Mineralogy at home. Diploma course. Fortunes now being made in Uranium and other minerals. Free catalog. Mineral Science Institute, Desk 3, 159 East Ontario, Chicago 11.

USED Correspondence courses and educational books bought, sold, rented. Free Catalog. Educational Exchange, Menlo, Georgia.

TRANSFORM yourself via subconscious dynamics. Free Amazing Brochure Box 847 (A-6), Ocean Park, Calif.

46 CONTESTS

PRIZE Contests provide Fabulous and Confidential Home Income Opportunity! Here's How and Where to Win Your Share! Send stamp! National Contest Bulletin, Box 2685-PS, Miami 16, Florida.

47 DETECTIVES

DETECTIVE Training. Phillips Secret Service System, 1917-C North Kenneth, Chicago 39, Ill.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write Wagoner, P-125 West 86th, New York 24.

DETECTIVE Training—Spare Time Study Learn fascinating Profession. Men-Women. Big Money. Become Private Detective. We Help. Laws For 48 States On File. Barnes Detective, Box 490, Times Square Station, New York 36, N. Y.

CRIMINOLOGICAL Investigation Training: Boston School Criminology, Box 2121-S, Boston 6, Massachusetts.

48 LANGUAGE OUTFITS

FREE Trial—Complete language course for home study by Linguaphone. The World's Standard Conversational Method. At home, easily, quickly learn to speak French, Spanish, German, Japanese, Russian, Modern Greek—any of 34 languages. It's like living in another land. Send for Free Book and details of Free Trial. No obligation. Try, don't buy! Linguaphone Institute, T-54-066 Rock Plaza, New York 20.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

INFORMATION: Any Subject! Certified Research! Griffith, 613 Latham, Wynnewood 1, Pa.

51 SPECIAL SERVICES

PUBLICITY — Ghostwriting — Research. E. Eller, 1000 Sutter St., San Francisco 9, California.

52 AUTHORS SERVICE

WANT Your Book Published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet PS. Vantage, 120 West 31, New York.

WRITERS: Book Manuscripts invited for publication on our cooperative plan. Greenwich Book Publishers, (Atten. Mr. Ibsen), 489 Fifth Avenue, New York 17, New York.

53 ADVERTISING, AGENCIES, ETC., FOR ADVERTISERS

FREE expert assistance for mailorder advertisers. Ratebook leading newspapers, magazines. 10c. Chicago Advertising Agency, Chicago 4.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 196C, Pleasant Hill, Ohio.

MAKE Day-Glo Daylight-Fluorescent Signs. No Experience. Equipment Needed. Starting Kit $2.98. Edward Cook, 51 Martin, Saratoga Springs, New York.

DRAW your way to fame. Free information. Manager, Cartoons-of-the-Month, Roslyn, New York.

CARTOONIST: Amateur, Professional. Prepare for animation with Max Fleischer's plan. Write Vera Coleman, 60 East 42nd Street, New York, N. Y.

PAINT Signs—Master die cut, outline letter patterns. Complete assortment. 1½" to 12" high, prepaid $2.00. Eyerly, P-583, Newton, Iowa.

PLASTIC Letters, Signs for Every Purpose, Stencils. Jim Ramsey, 95 Jefferson Street, Lexington, Kentucky.

YOU can Entertain with Chalk Talks. Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

56 RUBBER STAMPS & OFFICE SUPPLIES

RUBBER-Stamps — 4 — Lines — $1.50. Roughnecge's, 2 Lionel, Clark 2, New Jersey.

3 LINES—$1.00. Fast, professional service guaranteed! Artcraft, P.O. Box 8038, West Palm Beach 7, Florida.

CHOICE of 850 trademarks, and your name, address. $2.00 postpaid. Free literature. S. Eddy, 7 Greenacres, West Hartford 7, Conn.

THREE Line, Self Inking Pocket Stamp, $1.00 Postpaid. Hadfield Stamps, 205 West Crosstimbers, Houston 18, Texas.

THREE Line self-inking printer $1.00. Free Ball point pen. B&H Sales, Box 10282, Houston 18, Texas.

3 LINES, $1.00. Fast Service. Catalogue. Johnson, 443 McDonough, Brooklyn 33, New York.

57 PRINTING MULTIGRAPHING, ETC.

OFFSET printing $6.50—1000, 8½X11, 16 lb. National Letters, 251 W. 42nd St., New York 36.

QUALITY Mimeographing, printing. Free catalog. Curtier, PSM, New Lebanon Center, N. Y.

QUICK Service Printing. Letterheads etc. Free folder. Harold Kroll, Seymour, Wisconsin.

FREE catalog! Business printing, offset, mimeographing. Multicopy, 420 Columbian, Columbus 23, Ohio.

"HOW To Buy And Use Printing"—Free booklet tells how to cut costs, choose paper, type, etc. Samples and prices included. R-K Press, 825 Powdermill Lane, Penfield Downs, Philadelphia 31, Penna.

1000 EMBOSSED Business Cards $3.95 Postpaid U.S.A. Samples. Walter's Press, 2329 W. Lisbon Ave., Milwaukee 5, Wisconsin.

FREE Catalog, Business, Personal Printing. D M Press, Sebastopol, California.

BILLBOOKS—Statements—Envelopes—Rubber Stamps. Eddirose, Bronx 72, New York. Free Catalog.

RUSH Service. 100 8½x11 Letterheads $2.00 Postpaid. Bass Press, Knox, Indiana.

"PENNYSAVERS"—8½x11s—"Windows" — Statements. $1.00 — 100. Print. Mailorder, Ojai, California.

SENSIBLY Priced Business Printing. Special! 250 8½"x11" letterheads, bond, and 250 #10 heavyweight envelopes, $6.95. Postpaid, guaranteed. Free samples, quotations. Sparks Co., Box 4096, Austin 51, Texas.

MIMEOGRAPHING Neat work. Samples prices free. Callender, Box 91, New York 30.

500 3¼x2½ FOUR line gummed stickers 50c. Red Border $1.00. Moritz Printer, Saginaw, Michigan.

58 PRINTING OUTFITS, SUPPLIES

DO your own printing. Save money. Simple rules. We supply everything. Print for others; good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-8, Meriden, Conn.

RUBBER Stamp Making Presses, Hydraulic Operated, Electrically Heated. Also Supplies. Make Any Kind. Large Profits. Custom, Box 211-N, Springfield, Missouri.

MAKE your own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 2, Wisconsin.

PRINTING presses, type, supplies. Lists 3c. Turnbaugh Service, Mounted Route, Mechanicsburg, Pennsylvania.

59 PATENT ATTORNEYS

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS: Learn how you can protect your invention. A specially prepared booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the United States Patent Office and are prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 62B-D District National Building, Washington, D.C.

INVENTORS—This firm is registered to practice before the United States Patent Office and available to assist you in the preparation and prosecution of your patent application. "Patent Protection for Inventors" booklet containing detailed information and steps to take toward patent protection sent promptly upon request. No obligation. Victor J. Evans & Co., 241-G Merlin Building, Washington 6, D.C.

INVENTORS—If you believe you have an invention, we can make a preliminary search on your invention and advise you whether we think it can be patented. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-Y Victor Building, Washington 1, D. C.

"INVENTOR'S Guide" and "Record of Invention" free on request. Frank B. Ledermann, 154 Nassau Street, New York City.

PATENTS—Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers, Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

60 FOR INVENTORS

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS, if you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 631-E St., N.W., Washington 4, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS—Send for free patent information book and inventor's record. Registered Patent Attorney, Associate Examiner, Patent Office 1922-1929; Patent Attorney & Advisor, Navy Department 1930-1947, Gustave Miller, 66PSI Warner Building, Washington 4, D. C.

INVENTORS—Send today for instructive booklet "Patent Protection for Inventors" giving detailed patent information and outlining preliminary steps to take toward patent protection—also "Evidence of Invention" form. Victor J. Evans & Co., 242-G Merlin Building, Washington 6, D.C.

INVENTIONS And Patents Promoted. A-1 service for inventors for many years. Write Adam Fisher Co., 5418 Idaho, St. Louis, Missouri.

INVENTORS: Learn how you can protect your invention. A specially prepared booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the United States Patent Office and are prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 62A-D District National Building, Washington, D.C.

INVENTORS—If you believe you have an invention, we can make a preliminary search on your invention and advise you whether we think it can be Patented. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-X Victor Building, Washington 1, D. C.

"INVENTOR'S Guide" and "Record of Invention" free on request. Frank B. Ledermann, 154 Nassau Street, New York 38, New York.

PATENT Searches, including copies of nearest patents, $6.00. Reports airmailed within 48 hours. More than 100 registered patent attorneys use my service. For Free invention protection forms, write Miss Ann Hastings, P.O. Box 176, Washington 4, D. C.

INVENTION evaluation, Patent Searches, Product Development, Free Bulletin. Product Research Bureau, Box 181, Arlington, Virginia.

PATENT Searches $5.00. 48-hour service. Free Invention Protection forms. Write Raymond L. Smith, Patent Searcher, 620 Sheraton Building, Washington 5, D. C.

SEARCHES—Put your patent searches in the hands of a Registered Patent Attorney or Agent as he qualifies to give a worthwhile patentability report. Record of invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 939 Columbian Bldg., Washington 1, D. C.

FREE Record of Invention protection form airmailed. Keep your idea secret until recorded and witnessed on this form. Then we will search Patent Office, ($5), reporting and furnishing nearest patent copies, also telling how to sell the invention. Inventors Sales and Engineering Bureau, Box 4973, Washington 8, D. C.

PATENT Searches $5.00. 48-hour airmail service. Invention Protection forms free. Write Patent Engineering Service, 711 14th Street, N.W., Washington 5, D.C.

FREE facts about non-profit organization that helps you sell your invention. No royalty, no commission. Write—United Inventors, Dept. A61, 2712½ West Seventh, Los Angeles 57, California.

61 INVENTIONS WANTED

INVENTIONS wanted. Patented; unpatented. Tremendous Manufacturers lists. Global Marketing Service, 2420 77th, Oakland 5, Calif.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 30C, 631—E Street, N.W., Washington 4, D. C.

AMERICAN Congress of Inventors—quick response, free "Thomas Edison's formula for success." Inventors, Box 1481, Milwaukee 1, Wisconsin.

INVENTIONS promoted. Write for free booklet "Your Invention". Kessler Corporation, 761W, Fremont, Ohio.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, O.

SUPERIOR promotions. Patented; unpatented inventions. New, informative booklet on request. Superior, 338-342 North Rodeo, Beverly Hills, California.

INVENTIONS Wanted. Patented or Patent Pending. 25 years experience Promoting Inventions. National Service Bureau, 3122 Meramec, St. Louis 18, Mo.

CASH Buyers for ideas and inventions. Write National Inventors Institute, 457 Munsey Building, Washington 4, D.C., or 4900 Euclid Avenue, Cleveland 3, Ohio.

INVENTORS—Give us the opportunity to explain our selling plan for your invention, gadget or device, patented or unpatented; free particulars available upon request. Demarest And Demarest, Box 95, Battle Creek, Michigan.

INVENTIONS Wanted Now by my Manufacturer-Clients. Patented, Unpatented. Write Adams, Patent Broker, 66-R Wall Street, Financial District, New York City.

WE can handle your invention better, patented or unpatented, for development and sale. North American Inventors Service. Box 5014, St. Paul, Minnesota.

62 PATENTS FOR SALE

NOVEL inventions wanted. We pay all manufacturing, distribution expenses. Mail $1. Examination Fee: Weyman Company, (C-116) 939 Vanderhoeven, San Antonio 9, Texas.

63 MANUFACTURING

MODELS — small lot manufacturing. Metals, Plastics, etc. Millburn, Burlington, Kentucky.

64 MODELS, MODEL SUPPLIES

SHIP and yacht model fittings; blueprints. Send 35c for illustrated catalog #29 listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Michigan.

SHIP Models. Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. Illustrated catalog 30c. James Bliss and Co., Inc., Dept. PS, 342 Atlantic Avenue, Boston 10, Mass.

SHIP Model kits and numerous fittings from authentic plans including clippers, trawler, fishermen, frigates, privateer, radio control tug, etc. Send 25c for our new 1956 catalog. Model Shipways, Polio P. 39 West Fort Lee Road, Bogota, N. J.

"ST" Steam engine castings, fittings, boat plans catalog 15c. Ship Models Ltd., 186 Summer, Andover, Mass.

65 HOME CRAFTSMAN

PLASTICS home-craft course for Men and Women. Tells and shows how to make hundreds of fast selling plastics products. All plastics and material for 23 projects included in course. No special tools needed. Course pays for itself. Write for Free booklet. Interstate Training Service, Dept. D-2, Portland 13, Oregon.

ALL Crafts, Supplies. Large Free Catalog. National Handicraft, 199 William St., New York 38.

LEATHERCRAFT. Send 10c for new 60-page catalog of tools, supplies, kits. Including metalcrafts, enameling, ceramics, all other crafts. Complete stock. Reasonable. Since 1910. Sax Bros., Dept. PS-6, 1111 N. 3rd, Milwaukee, Wisc.

BUY wholesale nationally advertised power, hand tools, thousands other products at big discounts. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-RI, New York.

WOODWORKING for home craftsmen. Twenty-two manuals. Over 1,000 pages. 75 training projects. Only complete home training program available. Carefully written, profusely illustrated. Covers everything in cabinet making from wood selection to final finishing. Complete instruction in care and use of all hand and power tools. Prepared by manual training instructors. Write for free booklet. Interstate Training Service, Dept. G-2, Portland 13, Oregon.

LEATHERCRAFT, metal enameling, beadcraft, shellcraft, metal tooling, textile painting, many other crafts. Free big illustrated catalog. Kit Kraft, Dept. 336, Studio City 1, California.

FREE "Do-It-Yourself" Leathercraft Catalog. Tandy Leather Company, Box 791-C16, Fort Worth, Texas.

MARTALON You make (marble talc Onyx) Lamps, Bookends, etc. Beautiful Colors. Send 50c or $1.00 for usable sample and literature. Martalon, POB 4, Spring Valley, Calif.

SQUAREKNOTTERS: Make belts, handbags, lanyards, dog leashes, etc. Special offer! Beginner's book, catalog and quality cord samples 15c. P. C. Herwig Co., Dept. 71- P7,39 Henry St., Brooklyn 1, New York.

LEATHERCRAFT Tools, Leather Embossing Plates, Craft Accessories, Dies. Catalogue 10c. Louis Jones Engineering Company, 1613 Main, Fort Worth, Texas.

WALNUT, other Hardwoods Direct, Kits or Quantity. Woodcrafters, Box 2063 Nat. Sta., Springfield, Mo.

FREE. Complete Illustrated catalog. Leathercraft kits, supplies. J. C. Larson Co., 820 S. Tripp, Dept. 6026-L, Chicago 24.

STYLECRAFT sure fire hits. "Pretraced" leather kits. Handbags, Billfolds, Filigree Belts, over fifty other projects. Patterns on leather. Why trace? Just carve, assemble and lace. Large assortment "Precarved" kits also available. Send 25c for catalog, free folder. Refunded first order. Apache Leather Company, 2804 E. Washington St., Phoenix, Arizona.

TUB Enclosure—sliding double doors. Aluminum frames fit 56½ to 63¼ recessed tubs. White or Black Flamingo design. Shatterproof vinyl panels lift out. Install Yourself. "No Drilling." $39.95 ppd. Refund guaranteed. Request Brochure. Morrow Company, 20638 Lorain, Cleveland 26, Ohio.

KNOCKDOWN cedar chest and lumber free price list. Bedford Lumber Company, Shelbyville, Tennessee.

NEW Lever Ratchet Screwdriver. Blades Interchangeable. Free Circular. Wiltron Corp., Box 765, North Hollywood, Calif.

SIGN Painting—Master outline letter patterns, Brushes, Supplies. Eyerly, P-583, Newton, Iowa.

PLASTIC casting made easy. Illustrated course $2.00. Namberlite, P.O. Box 883P, Redwood City, California.

66 BUILD IT YOURSELF

CERAMIC tile coffee table. Prices and colors write Harold Fiebig, 212 N. 62 St., E. St. Louis, Ill.

AIR Conditioners — Home, Automobile. See Kool Engineering ad page 246.

FRAME your own roof easily with Easterly Rafter-framer. New type instrument. Mastered in few minutes. 1308 Lincoln, Watsonville, California.

BUILD Own Barbeque Grill! Two lifetime steel grates. $12.95, FOB, Canton. Free plans included. Brochure. Barb-Q Grate Co., Box 511, Dept. S, Canton, Ohio.

60 PAGE Booklets! "Cement Work," "Upholstering—Caning," "Woodworking," "Greenhouse," "Mechanical Problems," "Electricity," "Heat," "Radio," "Useful Tables," "Scientific Oddities," (Order by Titles) 10c each. Franks, 3121 South Racine, Chicago 8.

NEW Plans: Never before available. Electronics home protection. Do-It-Yourself in one hour. Burglars don't have a chance. Money back if not satisfied. $1.00 plus 6c stamps. Make your home burglar proof. S. J. Kasper, 768 Northwest 113 Street, Miami, Florida.

MAKE Electric Rotary Lawn Mower from Junk. Instructions $1.00. 12615 Chandler Blvd., North Hollywood, Calif.

DO-It-Yourself projects. Over 1,000 topics. Catalog $.50. Miken, Box 193, Lemoyne, Penna.

BUILD beautiful terrace walls. Make your own stone. Plans $2.00. R. Younkin, S. Main, Bowling Green, Ohio.

SAVE 60% on Window Fans. Free plans. Box #93, Marion, Iowa.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

COSTUME Jewelry supplies. Catalog and Samples. 35c. Largest line in America. Milady-Fair Co., G.P.O. Box 1328, New York City 1.

RHINESTONES. Jewelry settings, copper enameling, hobby kits. Illustrated catalog 10c. J & M Novelties, Dept. CG-4, Griffith, Indiana.

HIGHEST Cash For Old Gold, Broken Jewelry, Gold Teeth, Watches, Diamonds, Silverware, Spectacles, Platinum, Mercury. Free information. Satisfaction Guaranteed. Rose Refiners, Heyworth Bldg., Chicago 2.

I Positively Pay More For Old Gold. Please Try Me. Old Gold Pete, Boyce, Virginia.

USED and new watches. $2 up. Free List. Southern Watches, Gray, Georgia.

10 SWISS watches $18.00, catalog 10c. Berkowitz, 1150 Castlehill, New York 62.

HELBROS Watches: Jewelry 70% Discount—Catalog 25c. Dorinda, Huntington Station 6, New York.

69 FOR THE HOME

NAME On Plates, Doors $1.50, $2.00. Lawns, Standing $3.70, Hanging $3.50. Limit 13 letters. Numbers, limit 4, $3.95. Please Print. Check or Money Order. Schlewinsk, Lincoln Ave., Holbrook, L.I., New York.

FOAM rubber furniture cushions—Factory seconds 50% discount. Free catalog. Perma-Foam, 236-A Rhode Island Ave., East Orange, New Jersey.

70 OF INTEREST TO WOMEN

WANT To Make Big Money At Home? $5 profit in an hour possible with Invisible Reweaving. Make tears, holes disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details Free. Fabricon, 8336-S Prairie, Chicago 19, Illinois.

ENVELOPE addressing facts—extra income opportunities revealed thru HM service. Free details. House of Maxwell, Dept. 83-6, Wooster, Ohio.

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 181, 2954 Admiral Way, Seattle, Washington.

GOOD Money in Weaving. Weave rugs at home for neighbors on $69.50 Union Loom. Thousands doing it. Booklet free. Union Looms, 154 Post St., Boonville, N.Y.

IRON on Buttons—Sensational! Package 20 white shirt plus "Magic-Ease" Holder —Send $1.00. Ewart, 10934 Penny Avenue, Inglewood, California.

LADIES' Dupont Nylon Hosiery. 3 pairs $1.00. Sample Pair 35c. R. Plumb, Herkimer, New York.

71 FOR SALE MISCELLANEOUS

BEAUTIFUL Musical Jewelry Chest Shipped Direct To You From Switzerland. Only $5.98. Money Back Guaranteed. Maurice Tardiff, Wilder, Vermont.

WORK clothes—Coveralls $1.50. Pants $1.00. Shirts $.50. Used laundered. Satisfaction guaranteed—add 50c postage. Plymouth Surplus Sales, Gloversville 1, New York.

72 WANTED TO BUY

SCRAP Mercury (Quicksilver) containers supplied—Tantalum, Tungsten, Silver, Platinum. Metallurgical Products Company, Established 1909, 35th & Moore Sts., Phila. 45, Pennsylvania.

QUICKSILVER, Sterling, Silver Solders, precious metals. Mercury Terminal, Norwood, Massachusetts.

PRODUCTS wanted to sell Firestone, Woolworth, Sears, Department stores. Established 1919. Salespower, Box 816, Cleveland 22, Ohio.

74 RAZOR BLADES, SHAVERS

100 FINEST Quality, Double edge blades. Guaranteed. Send $1.00—after you receive blades. Kalnmals, 1934 N. Hoyne, Chicago 47, Illinois.

75 TATTOOING SUPPLIES

TATTOOING Outfits, licensed course. Brochures 25c. Zeis, 728 Leslie, Rockford, Illinois.

77 GEIGER COUNTERS & TREASURE FINDERS

FOR Treasure Locators, Geiger, Scintillation Counters, Mineralights, M-Scope. Fisher Research Laboratory. See Advertisement Page 248.

FIND Buried Treasure, gold and silver, with Goldak's sensational 3½ lb. "Find-It" locator, only $49.50. Write for free literature on complete line of mineral, metal locators; Geiger and scintillation counters. Goldak, 1540 W. Glenoaks Blvd., Glendale, California.

SCINTILLATION Counter with built-in speaker, loudspeaker alarm. Metal Locator works over salt water. No ground pick-up. Geiger Counters. Free Literature. Gardiner Electronics, 2545 E. Indian School Rd., Phoenix, Ariz.

GEIGER Kit. Detailed instructions, best value. Sierra Scientific, PS10, 5415 York, Los Angeles 42.

FIND Uranium, Buried Treasures, Valuable Mineral & Metals with completely Transistorized Detectors! You can buy for Less from world's oldest and reputable supplier of prospecting instruments. Get the same Electronic Metal Detectors, Geiger & Scintillation Counters, Mineralights, Dip Needle, Assay Kits, etc., we sell to U.S. and friendly Foreign Governments, treasure hunters, mining companies & week-end prospectors. Prices As Low As $14.95. We repair and trade all makes! Get Free literature on Profitable Prospecting & Prospecting For Recreation. Write, come-in or phone—we have the detection instrument you want! Radiac Co., Inc., Dept. PS-6, 489 Fifth Ave., New York 17, New York.

TRANSISTORIZED geiger counter, 3" meter, probe, speaker, inexpensive batteries, $59.50. Blackwell Electronics, 2801 W. College, Denver, Colorado.

GOLD, silver, metal detectors. Geiger counters for uranium. Vio-Lites. Sensational new fully guaranteed models. None finer. Information free. Detectron Corp., 5528 Vineland Ave., North Hollywood, California.

LITHIUM—Wonder metal of the Atomic Age. Free Booklet describes prospecting information, uses, etc. Nu-Age, Box 123, Calgary, Alberta, Canada.

URANIUM Finding made easy! Completely transistorized Geiger counters. Extra sensitive. Lightweight. Scientifically engineered. Unconditionally guaranteed. Also complete line prospecting instruments from $19.95. Write for free information, techniques. Universal Atomics Corp., Dept. PS6, 19 East 48th Street, New York City.

GEIGER Counters. Kit $15.95, send $5, balance C.O.D. Catalog. American Laboratories, 471 Clifton Avenue, Newark 4, N.J.

URANIUM Prospectors Black Light Kit Not a toy but a real tool for the experienced prospector. Self-powered (6 Volt Battery not included) easily assembled with soldering iron and screwdriver. Shipped postpaid for only $16.95. H. Petrie Logan Research, 917 West 53rd Place, Chicago, Illinois.

NEW Uranium detector kit, $8.49. Free catalog. CMG, Box 611-PS, Laramie, Wyo.

SECRETS and Mysteries of treasure hunting revealed. Illustrated book $1.00. Circulars free. Century Press, 3312 Melton Street North, St. Petersburg, Florida.

78 WATCH REPAIRING

WATCHMAKERS' — Jewelers' Supplies, Instructions. Catalog 20c. Bengal Company, Culver City, California.

WATCHMAKERS' Tools, Materials, Supplies, Watches. Catalog. Gales, Box 1000, Chicago 90, Illinois.

USED and new watches, $2 up. Free List. Southern Watches, Gray, Georgia.

WATCHMAKERS' Journal contains instructive articles on watch repairing. $1 year. Sample copy 20c. Dean Company, Box 3218-A, Daytona Beach, Fla.

WATCH and clock repairing books. Free information. North American, Dept. 26F, 2320 N. Milwaukee, Chicago 47, Illinois.

79 MISCELLANEOUS

BUY Wholesale thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-V1, New York.

WHOLESALE Catalog! 30-80% Discounts! Appliances, Musical Instruments, Typewriters, Phonographs, Watches, Jewelry, Recorders, Housewares, etc. Consolidated Distributors, 21-18 Lafayette, Paterson 15, New Jersey.

$5,199.90 WAS Paid to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 182, 2954 Admiral Way, Seattle, Washington.

DISPOSAL Sale: New—Used Books 12—$1. Samples 30c. (Stamp Collectors Grabbag Lot $1., Extra Special $2). Persil, 436 N.Y. Ave., Brooklyn 25, N.Y.

300-500 BIG Mails guaranteed, 25c. Gallinger, Box 151, Colvin Station, Syracuse 5, New York.

"MULTIFLEX" Pastry Lifter. A sensational help in kitchen. Free literature. M. Kellogg, Box 155, Stratford, Connecticut.

GOLD-Plated Spy Camera Outfit. Complete with film, leather case — $2.98. Lowilco, 4145 Broadway, Chicago 13, Illinois.

SOUVENIRS — Personalized Dice From Reno and Las Vegas—$1.50 per pair. Fortune-Wray Enterprises, 770 Topaz Drive, Reno, Nevada.

FREE Wholesale Catalogs! Sporting Equipment — Cameras — Homewares — Everything Econ-O-Mart, Whippany 6, New Jersey.

FORTUNE Possible raising fishworms and crickets. Free Information. Carter Farm-12, Plains, Georgia.

RECEIVE Magazine samples, Mails, Offers By Hundreds. Get listed 25c. Rorick's, Cincinnati 26, Ohio.

BIG Mails, four months listing, 25c. Wright Publications, 2276 Hubbard, Memphis 8, Tennessee.

BOOKS on antiques and their prices. Free circular. Warman Publishers, Uniontown, Penna.

PICTURE Post Cards Made From Your Photograph. 1000 $11.00. Raum's, 4154 Fifth Street, Philadelphia 40.

CIGARETTES—Roll 20 for 9c, guaranteed to please. Facts free. Pete Moberly, Box 796, Owensboro, Kentucky.

CESSPOOL Trouble? Use Sursolvent, the miracle cesspool and septic tank cleaner. No pumping necessary. Restores systems to a condition approaching newness. Electric Sewer Cleaning Co., Boston 34, Mass.

GERMAN Lists Anything Manufactured 100 Addresses 25c. Burke Associates, Manchester 2, Massachusetts.

101 MIXED drink recipes in one useful book. Send $1.00. Ambassadors Club, Box 201, Newport News, Virginia.

MAKE Garden Fresh looking flowers. Guaranteed results. Course $3.00. Milken, Box 193, Lemoyne, Penna.

"HOW Much Should You Drink?" Inebriation Computor devised by M.I.T. graduate tells the answer. Use it at your Next Party. $1.00. Mrs. John C. Betts, Penllyn, Pa.

"HOW Can I Find Out?" You Can! Information confidentially developed. Any matter, person, problem. World-wide. Officially licensed. Established 1922. William Herman, 170 Broadway, New York.

THE Courier! Sample of this fast growing mailorder publication for stamp! Courier, 910 Marion, Pharr 17, Texas.

PSORIASIS Sufferers: Write for Free important information today. Pixacol Co., Box 3583-S. Cleveland 18, Ohio.

RULE Others with thoughts. (Full Course.) $2.00. Delmar Wisdom, 846-S66 Sunnyside, Chicago 40.

MEXICAN Legal Matters. A. Espejo, Box 217. Tijuana, Mexico.

REMAILING Hawaii 50c, Los Angeles 25c. Box 25592, Los Angeles 25, California.

MAIL Received—Forwarded $3.00 month. Mail-O, Box 1007, Gardena, California.

HEAR Better With Your Hearing Aid. Free Booklet. Wallace Service, Gloucester, Mass.

"SEVEN Days To Success" can help you attain richer, fuller living. Free copy. Box 6, Northwest Branch, Miami 47, Florida.

BORROWING by Mail. Loans $100 to $600 to employed men and women. Easy, quick. Completely confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Give occupation. State Finance Co., 323 Securities Bldg., Dept. W-227, Omaha 2, Nebr.

MEXICAN Law, General Practice Attorney, Apartado 79, Juarez, Chih, Mexico.

LETTERS Remailed 25c. Los Angeles Classified $1.00. Post Cards 10c From Studio City or Idyllwild, California. Lilart Co., Box 502, Idyllwild, California.

LETTERS remailed 25c, Classifieds 75c. Lewis, Box 8053, San Antonio, Texas.

TRUE Image Mirror. See Yourself As Others See You! Directions and Drawings All For One Dollar. Surprise Yourself and Friends. Simple To Make. Profitable. Universal Research, 496 Colusa Ave., Berkeley 7, California.

MIAMI or Miami Beach remails 50c. Monthly $3.00. Box 731, Miami Beach, Fla.

REMAILING 25c. Classified $1.00. Miller, 1175 Second Street, Grand Rapids, Michigan.

INTELLIGENCE Test — exact "I.Q." Score it yourself! $1.00. Testing Service, 4912-A Reid Way, Sacramento 19, Calif.

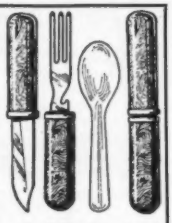
LETTERS remailed 25c. Postcards 6 for $1.00. Mail received—forwarded $3.00 monthly. We will do your New Orleans Shopping. . . . Write, will quote prices, purchase and forward obtainable items for small fee. Larry's Mailing Service, 4106 Franklin Ave., New Orleans 22, Louisiana.

CHICAGO Classified Ads, airmailed $1.00. Information. Marbo, 6442 Newgard, Chicago.

LETTERS Remailed 25c, 6—$1.00. Permanent Mailing Address. J. Love, 1419 E. 83rd, Los Angeles 1, California.

FREE! Introductory drawing, any subject. Send request; stamped, self-addressed envelope. Sketch, 3122-38th Street, Sioux City, Iowa.

4-WAY COMBINATION
KNIFE, FORK, SPOON SET
WITH BOTTLE OPENER



This handy little set is made of non-corrosive stainless steel with beautifully colored, easy to clean plastic handles. Knife and fork slide snugly into each other's handles, spoon slips into pocket on knife handle, making a neat little package that's safe to carry. Fits easily into pocket, purse or glove compartment of car.

Wonderful for barbecues, picnics, or the home. Ideal for campers, hunters, fishermen

Available in red, yellow, green and ivory.
$1.25 PER SET PPD.
4 sets only $5.00 Ppd.
Knife and fork set, without spoon, $1.00 Ppd.

Please Specify Color. Order Today from
LEON RUMMEL Dept. S, 328 E. Washington Blvd. Los Angeles 15, Calif.

LOOK! GUN COLLECTORS

Authentic Replica of the Police Special Smith Nose .38 Popular with Secret Agents and Police.

ONLY $3.00 each 2 for $5

ALSO AVAILABLE:
German Luger Famed
Historic .44 Colt Frontiersman
Army .45 Automatic

Many other famous models available —

You'll be amazed at the fidelity of detail found in our guns. Cast aluminum for exactness; finish gun metal black. The feel and look of the real thing.

(No Canadian orders. Add 3% tax to Calif. orders)

SEND CASH OR MONEY ORDER

WEST COAST NOVELTY CO.
P.O. Box 9205-P, Long Beach 10, Calif.

LOOK!

FREE TRIAL PLAN

A MILLION THRILLS!
High Power
BINOCULARS
33 Models: $9.95 to $135
Free! Catalog & Book "How to Select Binoculars"
BUSHNELL Binoculars
Dept. P26 43 E. Green Pasadena, Calif.

YOUR MIRROR WILL SHOW
MUSCLES OF IRON
IN JUST 10 DAYS says Joe Louis

Are YOU
TIRED? UPSET?
FAT? SKINNY?
NERVOUS?
Let Joe Help You

Yes, you can build a powerful body . . . gain more confidence and be the envy of your friends! That's the promise of Joe Louis and other great stars. These great stars know you want ACTION — and they promise it — FAST.

CONDITIONING SECRETS BY TEN CHAMPIONS

$1.00

Yogi Berra, Kid Gavilan and Ted Kluszewski have prepared an exciting Conditioning Course for your home that is easy to do . . lots of fun.

Set of Special Exercises for only one dollar. Results guaranteed in 10 days or your money back. EXTRA—Joe Louis' Fight Secrets if you act now!

THE NATIONAL SPORTS COUNCIL
33 W. 46th Street, New York 36, N.Y.—Dept. Q-66

. . . now with the NEW

Airguide Outboard SPEEDOMETER

it's so easy to know how fast you can go

ONLY $15 COMPLETE

AND WHAT A GIFT FOR A SPORTSMAN!

The only complete portable speedometer—No tubes to connect—No holes to bore

- Designed especially for outboards. Mounted on transom near motor. Head, bracket, stabilizer and pitot all in one compact portable unit. Instantly attached and detached, easy to carry (only 1½ lbs).
- Exclusive Airguide CONTRALOG® movement permits nearly uniform graduations from top speeds down to zero for easier reading.
- Sturdily made of finest materials. Fits transoms from 12" to 20" high and up to 1¾" thick. Dial diam. 3". Choice of speed ranges 0-15, 0-30, 0-45 MPH. Other models available for permanent installation.

Made and guaranteed by
AIRGUIDE INSTRUMENT CO.
Chicago 47, Ill.

SEE THEM AT YOUR DEALER'S

Smoother casting longer lasting

casting-spinning-squidding lines

...Preferred at Famous Fishing Spots

Two great names in lines... **H-I**—FLOAT, the famous hollow center, non-sinkable fly line ... and SKIRR, America's No. 1 fresh or salt water line for spinning, bait casting, surf casting and squidding.

H-I unconditionally guarantees these lines to be the finest on the market today, regardless of price! Prove it for yourself, at your dealer's.

Look for H-I on the tackle you buy

Rods, Reels, Lines, Lures, for every fisherman and every kind of fishing

Valuable Fishing Guide. Send 25¢ to

HORROCKS-IBBOTSON CO., Dept. PS-616, UTICA, N.Y.

Manufacturer of the largest line of fishing tackle in the world

---

SENSATIONAL NEW **BENJAMIN SUPER CO_2 ROCKET GAS PISTOL** with HI-LO (2 STAGE) JET POWER

Cal. .177 or .22

$15.00

Benjamin CO_2 CARBINE Rifle with HI-LO Jet Power $16.50

HARD HITTING — ACCURATE — ECONOMICAL
SAFE · CONVENIENT · PRACTICAL · NON TOXIC

EASY TO OPERATE—NO PUMPING—NO FLINCHING. Get 50 SHOTS from each 10¢ STANDARD SIZE CO_2 (Soda) CARTRIDGE. Up to ⅝" penetration RIFLED—Shoots Benjamin H-C Pellets & Darts. FOR TARGET and SMALL GAME. FREE FOLDER

BENJAMIN AIR RIFLE CO., 852 BARRY ST., ST. LOUIS 4, MO., U. S. A.

More Fun AND BOATS · Standout light-weight design · Choice of 6 trim models

Save nearly 20% **Buy Direct · Get More · Pay Less!**

SAFE ★ RUGGED ★ STYLISH CAR-TOPPERS!

Modified Vee hull, full keel and runners, rub-rails, reinforced ribs and special transom for top outboard performance, rivet-locked aluminum, seams lapped and sealed; seats Styrofoam filled; greatest safety; lowest upkeep; no caulking.

WRITE FOR COMPLETE DETAILS TODAY!

AQUALINE BOAT Corporation

YORKLYN 4, DELAWARE ★ CEdar 9-7549

SKIN DIVING!

THE WORLD'S MOST THRILLING SPORT FOR ALL AGES

AQUA LUNGS

SPORT FISHING and DIVING EQUIPMENT

The world's largest stock deep sea commercial and sport diving equipment. Large illustrated catalogue describes complete selection of lungs, tanks, guns, spears, goggles, etc.

SEND FOR NEW 1956 CATALOGUE 20¢

M&E MARINE SUPPLY CO.
P.O. BOX 601 G · CAMDEN 1, N.J.

Auxiliary Accelerator...

LEFT FOOT PEDAL

Step on the gas with either foot with equal ease. Drive relaxed. Guaranteed for the life of the car—which originally installed on. FITS ALL CARS.

PRICE $6.95 Paid Delivered to You · ORDER FROM R. V. LEHNER, Ness City, Kansas

---

WATER SKI KITS $16.00 EXP. INCL.

- Harness Included
- Non-Splitting
- Non-Warping
- 7-Ply Molded Plywood

Ready shaped and drilled genuine mahogany skis, 68" long and 7" wide. Just paint or varnish and attach included harness. We pay express if money included with order.

TAFT MARINE WOODCRAFT

DEPT. PS-6 · 636 39TH AVE. N.E. · MINNEAPOLIS 21, MINN.

SWIMMING POOL SUPPLIES FOR ALL SIZE POOLS AT MONEY SAVING PRICES

SPECIAL!—Self Filtering Vacuum Cleaner. No pumps or motors. Works off any garden hose. Reg. $70 value ONLY $29.50—Automatic Chlorinating Packettes for small pools to 1000 gallons. Box of 10 ONLY 98c. Full 70% Strength Chlorine Powder 1 lb. ONLY 98c. Five lbs. ONLY $3.69. Free Automatic Chlorinators. Algicide, Reg. Strength, Gallon $7.00. Quart $2.49. Pint $1.49. ALL PRICES POSTPAID. Commercial and Large users please request quotations. Free Catalog On Request.

P. J. HILL CO. Dept. V-710
NEWARK 1, NEW JERSEY

Zing! **SOCK-O SUPER SLINGSHOT**

$1.50 ppd.

SILENT · RIFLE FAST · POWERFUL · ACCURATE

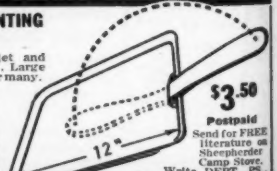
Great for small game and target shooting! 45 pound pull. Big, sturdy stock. Lively raw rubber. Sweet shooting. Free! 50 Sock-O "cannon balls", extra rubber and target. Sent by return mail. Guaranteed. Every sling fully tested. No COD's please.

SOCK-O, 7000 Melrose, Los Angeles 38, Calif.

At last! **A FOLDING SKILLET GRILL**

FOR CAMPING • HUNTING FISHING • PICNICS

This combination skillet and grill is a full 12" x 12". Large enough to cook for one or many. Handle folds back flat saving valuable space. Nickel plated. Ideal for all outdoor purposes. An excellent gift item for Father's Day and any day. Made by the manufacturers of the famous Shepherder Camp Stove.

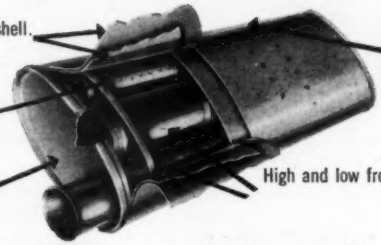


$3.50 Postpaid

Send for FREE literature on Shepherder Camp Stove. Write DEPT. PS.

RAINIER MFG. CO., 6629 8TH AVENUE · LOS ANGELES 43, CALIF.

HOW TO GET A SAFE MUFFLER AND SAVE UP TO $8.00 BESIDES



A leaking muffler is dangerous *long before* it gets noisy. One hatful of carbon monoxide gas can kill you in 2½ hours. One cupful slows your reactions *dangerously*. You're safer with Silentone's double wrapped shell, a third heavier than in ordinary mufflers. It protects you against dangerous leaks, makes your muffler dollar go farther by lasting up to 33% longer.

And do you know why so many new cars have duals? Modern engines need them to conserve their greater horsepower. So think how important it is if you have a single muffler that it be a good one. Silentone® gives you more power, yet costs less. Scientifically designed to keep back pressure at a minimum, it assures you top performance and mileage. Many stores install Silentone at big savings to you. Buy Silentone and save up to $8. P.S. If you prefer that deep mellow tone, get Dynatones. They're engineered, not packed. Write for name of your nearest store.

Sold only by America's leading automotive chain stores

SILENTONE MUFFLERS · DYNATONE · GLASS-PACKED
Dept. 4F, Toledo 1, Ohio

END YOUR OIL CHANGES *Forever!*

WITH THE NEW "Miracle" OIL FILTER

The Secret Is Out!
YOUR OIL MUST PASS THROUGH 100's OF SHEETS OF CLOSE GRAIN TISSUE
—MIRACLE uses a tightly wound filter paper, a process successful in industry and science for many years. It absorbs all foreign substances just like a blotter, but DOES NOT destroy the detergents.

LABORATORY TESTS
—recent laboratory tests, covering oil in continuous service, shows minimum fuel dilution and practically 100% removal of foreign substances.

ORDER YOURS NOW
—start saving money and enjoy smoother engine operation.

Send check or M.O. for only $9.95 for conventional type filter, or $14.95 for Full Flow Conversion Kit: or sent COD at slight increase for postal handling charges. Complete instructions for simple installation with each unit. Give make and year of your car and name of present filter.

ABSOLUTE MONEY BACK GUARANTEE

PAT. No. 2,738,879

ONLY $9.95 POST PAID

Oil Does Not Wear Out
—if filtered through the MIRACLE. Just add enough new oil to replace the water, carbon and wastes absorbed by the MIRACLE filter unit, renewable at any grocery store for only 15 cents. No acid neutralizer needed. Positively eliminates sulphureous acids.

SATISFIED USERS
—by the hundreds tell the story of complete satisfaction. Conventional type unit adapted to all car models—1953 or older.

FULL FLOW CONVERSION KIT
—eliminates crawling under car to change filter unit. With MIRACLE Full Flow Conversion Kit, for 1954-55-56 models, just open the hood and do the whole job in 5 minutes.

Price Only $14.95

Modesto Engine Conversion Co. ☆ P. O. BOX 1733 - Dept. S MODESTO, CALIF.

AMMUNITION

for a fraction of regular cost

Reload a whole carton for the cost of a few rounds of factory ammunition. Shotgun shells, rifle and pistol cartridges can be reloaded safely and easily with an inexpensive set of famous IDEAL Reloading Tools. 164 page IDEAL Reloaders Handbook ... $1.00, postpaid. Free folder on request.

THE LYMAN GUN SIGHT CORP.
MIDDLEFIELD, CONN.

NEW HULL AUTO COMPASS

INSTALLS, OPERATES WITH SPARKLING NEW PERFECTION

Hull—the last word in accurate, dependable auto compass performance—also offers the latest in mounting brackets, for easy, best installation in ANY car.

NEW HULL COMBINATION MOUNT

Works as SCREW-DOWN STAND along Lower Windshield Molding . . . Hanging Bracket along Upper Molding or Mirror Foot . . . Vacuum Cup anywhere on GLASS.

At Better Dealers Everywhere, or Write For Free Literature

HULL MFG. CO.
P. O. Box 246-E6, Warren, Ohio

FOUR-COLOR SELECTION
Beacon-lite illuminated $6.50
Streamline non-illuminated $4.95

250 POWER . . . . .

Complete Telescope Lens Kit only **$3.49** postpaid

Conquer Space, Explore the Universe, Planets, Moon craters, New Stars, etc. Complete Lens Kit consists of 80 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PS-44

FREE!

New 1956 Edition of the famous *Poly-Choke* "WINGSHOOTER'S HANDBOOK"

28 fact-filled pages written by experts. All about choking, bore diameters, shotgun patterning and how to improve your wing-shooting. Send for your copy TODAY!

Write to The **POLY-CHOKE** Co., Inc. 615 Tunxis St. Hartford 1, Conn.

DANGER AHEAD!

It's a life saver — the Delta Flashing Powerlite. Brilliant red flashing top light. Powerful side spotlight — all in one compact unit! 4-way switch. 6-volt battery. Get one! Less battery, only **$6.95**

Delta Electric Co., Marion, Ind.

Delta FLASHING POWERLITE ELECTRIC LANTERN

GET MAXIMUM USE OF 4-WHEEL DRIVES!

MAKE 2 VEHICLES OUT OF 1!

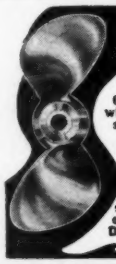
New **LOCK-O-MATIC!**
- Automatic free-wheeling 2 w. d.
- Automatic 4 w. d. forward & reverse
- Locking control for "solid" 4 w. d.

Your 4 w. d. is a 4 w. d. work horse or 2 w. d. "pick-up" as you need it—*as you shift!* No drag, gear whine, shimmy in 2 w. d.; big savings in gas, tires, repairs. For all 4 w. ds. to 1½ tons at dealers or write:

Jeep

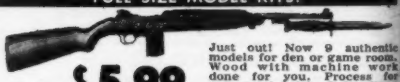
WARN HUBS
WARN MANUFACTURING CO.
Riverton Box 6064-B6 Seattle 88, Wash.

TOP SPEED BETTER SKIING or FUN



MICHIGAN AQUA-JET propellers win twice as often in the "National Stock Outboard Championship" as all other wheels, custom-built included. Inexpensive stock propellers, requiring no alteration of lower unit, each specifically engineered for motor used (5 HP and larger). Write for FREE 1956 catalog —the Outboarders' Bible. Shows how to get better performance from specific motor-boat-load combinations for racing, skiing, cruising, pleasure — also fine line of boat fittings. Michigan Wheel Co., Dept. PS-6, Grand Rapids 3, Mich.

FULL SIZE MODEL KITS!



M. 1 Carbine **$5.00** The original kit

Just out! Now 9 authentic models for den or game room. Wood with machine work done for you. Process for gun metal finish. Order direct or send 15c for interesting, revised catalog. Completely illustrated.

For NEW illustrated catalog of 9 models send 15c to:
O'BRIEN GUNCRAFT (C) P.O. BOX 657 MADISON, WIS

14' Model Pictured

FREE! BOAT KIT CATALOG

42 TOP PERFORMING MODELS, 8' thru 18'
. . . from $39.25 incl. frt.

Runabouts, Cruisers, Convertibles, Fishing, etc., for every purpose with modern styling, advanced design. No experience necessary, amateurs can easily assemble. Save ½ to ⅔ "factory-built" prices!

FIBERGLAS, TRAILERS, ACCESSORIES

LUGER INDUSTRIES, INC. DEPT. A-8 3404 Lyndale S. Minneapolis 8, Minn.

DREAMSHIP! . . . *the spectacular Lark "Sportster"! A gifted designer's concept of a hull to fittingly complement the dramatic beauty and brilliant performance of Evinrude's premier model, the fabulous new Lark. From coast to coast this is the motor being chosen for smartest runabouts of every make. See your Evinrude dealer. Look for his name under "Outboard Motors" in your phone book. Catalog free.* **EVINRUDE MOTORS,** *4287 N. 27th St., Milwaukee 16, Wisconsin.*

the Lark

by

Evinrude

pioneers in *quiet* outboard motors

A Division of Outboard, Marine & Mfg. Co. • In Canada, Mfd. by Evinrude Motors, Peterborough

Just what paste wax needed - a built-in cleaner!

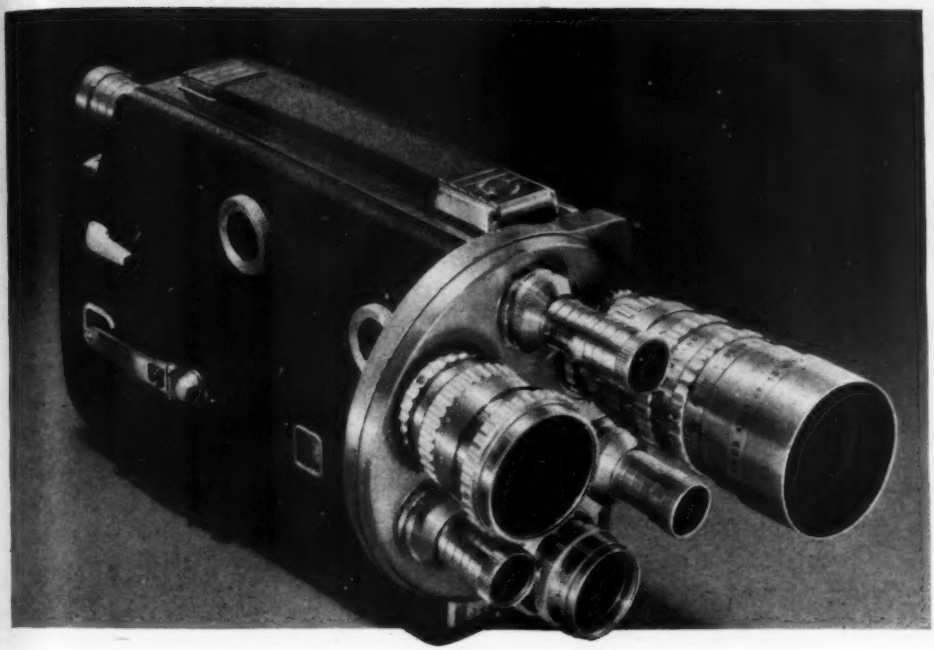
Johnson's J-Wax new Paste Wax Discovery does the cleaning work for you!

Start right in waxing! No extra cleaner needed—nothing else to buy!

Here's what you've been waiting for—a paste wax with a cleaner built right in! Johnson's new J-Wax saves you hours of pre-cleaning. J-Wax takes the dirt off for you—replaces grime with a crystal-clear coating of wax. Even the dirt you can't wash off loosens instantly and disappears as you rub on this new self-cleaning paste wax.

Then watch the high brilliant luster that comes as you buff. J-Wax sets smooth and hard—bonds itself into a long-lasting wax-tight seal. Gives your car tough wax protection it needs for any weather. And look! The colors are far brighter, truer—even the chrome glistens.

Get your car ready now for the months ahead—with J-Wax. It's the easiest, fastest way to genuine wax protection—*paste wax protection!*



NOW IT'S HERE! THE MAGNIFICENT NEW

Cine-Kodak K-100 Turret Camera

Truly a 16mm camera built to perfection—not to price!

The K-100's turret accepts your choice of any three great Kodak Cine Ektar Lenses, 15 to 152mm, without optical interference. When you click the turret to shift from the standard lens to a wide-angle or telephoto lens, the matching viewfinder automatically clicks into correct position.

Luxury features? The K-100 is packed with them. Accepts single- or double-perforated roll film—gives you an unequaled 40-foot film run from *each winding* of its powerful spring-driven motor. Full speed range from single-frame exposures to slow motion . . . built-in exposure guide . . . precision footage meters to tell you exactly how much film can be exposed before rewinding, how much unexposed film remains on the roll. Provision for hand crank (for producing multiple exposures, dissolves, special effects), and for attaching electric-motor drive. K-100 Turret Camera with superb Ektar II 25mm Lens and matching viewfinder, from $315. See it soon!

Ask your dealer to show you the other 16mm and 8mm cameras in Kodak's famous family of movie-makers. Prices begin as low as $29.95!

Ask about small down payment, easy terms

Prices include Federal Tax and are subject to change without notice

Eastman Kodak Company, Rochester 4, N. Y.

Kodak
TRADE MARK

24% more road horsepower—for hill climb!

24% more road horsepower—for passing!

Champion introduces a great new spark plug

Tests prove new Champions give big power boost to cars that have gone about 10,000 miles without a spark plug change. If you haven't changed your plugs recently, put in new Champions—and feel the difference immediately!

You just can't imagine what a difference new 5-rib Champions can make in your car's actual road horsepower.

But this difference has been proved—without a shadow of a doubt—in tests conducted by one of the country's largest independent research centers. Regular passenger cars whose plugs had gone roughly 10,000 miles were tested first with their regular plugs; then with new Champions.

Nothing about these cars was changed except their spark plugs. Yet there was an immediate increase in their road horsepower—the real power actually delivered at the rear wheels!

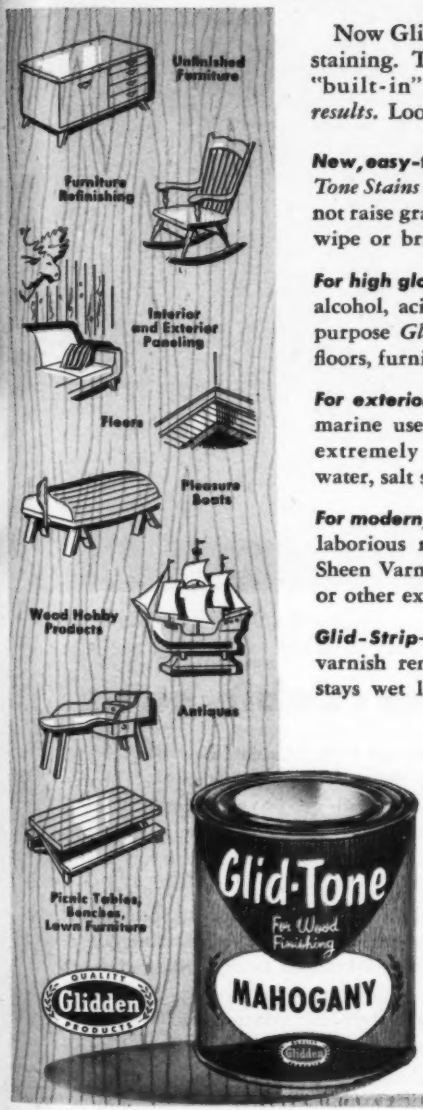
Some of the results were spectacular. For example, a 1955 six-cylinder car whose plugs had gone 10,000 miles actually showed a gain of 72.5% in road horsepower! A 1954 V-8, whose plugs had gone 12,000 miles, got a boost of 53.5%. Some cars, of course, showed smaller gains; 20% in the case of one 1955 V-8 and only 6.5% (the smallest gain) in another. *But the average road horsepower gain for all cars tested was a fraction over 24%!*

And what a difference these new plugs can make in your car's starting! Tests show Champions reduced starting time by as much as 71%—with an average of 39% for all cars tested!

If you haven't changed plugs recently, it's high time to install new Champions. Whatever your car, these great new plugs give you more actual road horsepower—*immediately!*

Glidden Announces . . .

New GLID-TONE products specially made for do-it-yourself wood finishing



Now Glidden takes the "mystery" out of wood finishing, staining. The new array of Glid-Tone products have "built-in" features for amateur use; give *professional results.* Look for the Glid-Tone label at your paint store.

New, easy-to-use stains in color! Use *Glid-Tone Stains* either inside or out. Seals, does not raise grain. Extremely easy to use—just wipe or brush on, wipe off!

For high gloss and highest resistance to alcohol, acid, heat and abrasion, use all-purpose *Glid-Tone Gloss Varnish* . . . for floors, furniture, table tops, bars, cabinets!

For exterior trim, paneling, boats and marine uses—*Glid-Tone Spar Varnish* is extremely tough, withstands effects of water, salt spray, heat, sun, cold.

For modern, hand-rubbed effects without laborious rubbing, use Glid-Tone Satin Sheen Varnish. Self-priming. No thinners or other extras required.

Glid-Strip—a safe, effective paint and varnish remover. Lets you work larger areas because it stays wet longer. Non-flammable. Cleans up with water!

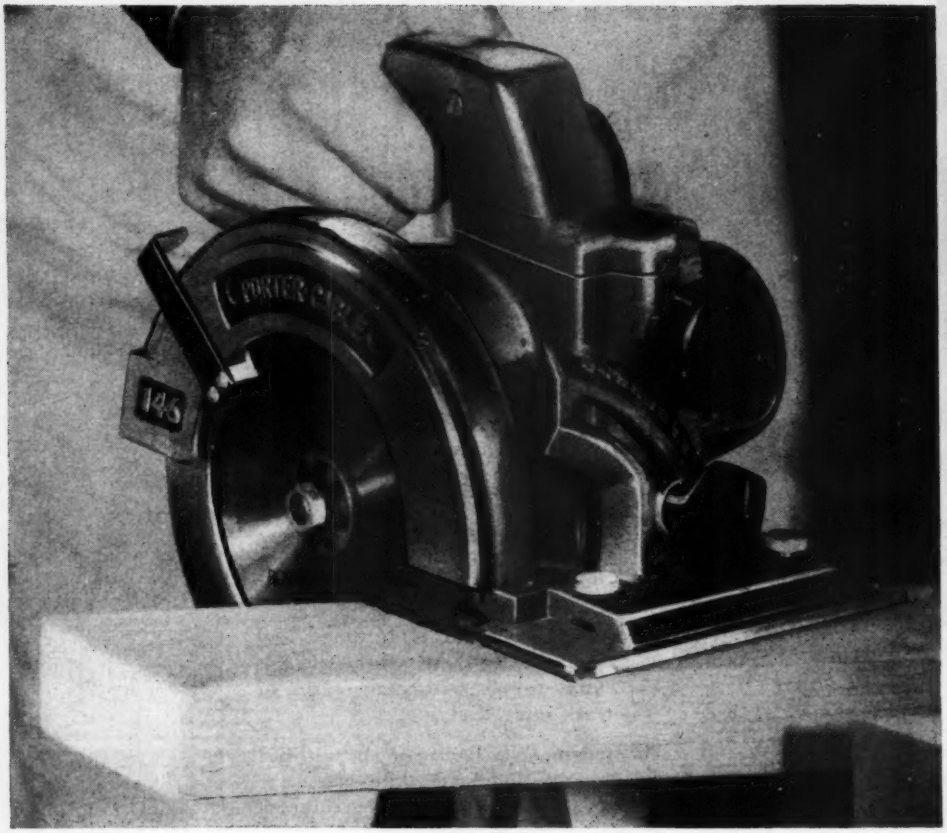
Glid-Tone Natural Wood Filler—for filling open-grained woods . . . oak, chestnut, walnut, mahogany, pine, fur, redwood.

Glid-Tone Crystalacq—an all-purpose, crystal-clear brushing lacquer coat for beautifully grained light woods. Dries in only 20 minutes, provides lasting protection. Non-yellowing.

Glidden
Pacemaker in Paints

FREE! Write for Glidden Service Sheet PS-6 . . . complete wood finishing directions!

THE GLIDDEN COMPANY • Cleveland 2, Ohio
In Canada: The Glidden Company, Limited, Toronto



Tremendous values in these

three great new Porter-Cable saws!

From Porter-Cable's fifty years of leadership in electric tool design come these three brand new power saws . . . farther ahead than ever in design, in versatility, in solid *value*.

Model 146 is a rugged 6½" saw of full *professional capacity*—makes every cut it takes to build a house. It slices through 2" dressed lumber, even at a 45 degree angle—has a host of special features for convenience and long life. Yet it's priced at only $69.50—and you'll find a special Introductory Offer on the opposite page that saves you $12.00 on a complete Model 146 Kit!

If you prefer a saw with blade on the left, be sure to see Porter-Cable's new Model 157, shown opposite—a big, husky 7¼" professional saw with exclusive Kickproof Clutch, full ball bearing construction, and many other features at only $89.50.

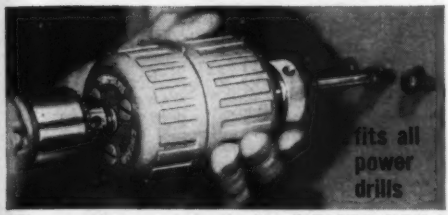
Finally, there's *the world's finest professional saw*—the all-new 8½" Model 528 Speedmatic. *More* speed, *more* power—telescoping guard, exclusive Kickproof Clutch, calibrated depth gauge – and every conceivable feature of *quality* design and construction.

See these new professional quality saws at your Porter-Cable dealer's today—or write for full information *now*.

SUPREME

Versamatic

REVERSIBLE SCREW DRIVER AND SPEED REDUCER



First time ever! It REVERSES!

Drive *and remove* screws with Supreme Versamatic. Versamatic reduces speed 7 to 1, increases power 7-fold. *Reverses* with one twist. Handles even the largest screws with ease. Also for nut running (adapter furnished); tapping; and all heavy duty drilling where speed reduction is needed. Fingertip control means safe, fast work. Complete set $14.95. (½" chuck extra). At better hardware stores.

SUPREME PRODUCTS, Inc., 2222 S. Calumet, Chicago 16

For

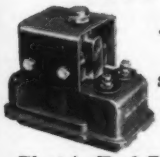
QUICK STARTS

in any weather...

install a

Stewart-Warner

electric fuel pump



—for cars, trucks and buses

Enjoy dependable *fast* starting every time you step on your starter! From the moment you turn your key, the Stewart-Warner Electric Fuel Pump delivers a steady, uninterrupted flow of gas to your engine. Ends vapor lock, gives positive starting and more reliable performance the year 'round, regardless of weather. Operates independently of engine. Easy to install. In use today on hundreds of thousands of vehicles. Ask about the Stewart-Warner Electric Fuel Pump at your garage or car dealer today!

STEWART-WARNER

Also manufacturers of Speedometers, Tachometers and Gauges for Automotive, Farm and Marine Use

Instrument Division, Dept. P-66
1840 Diversey Parkway, Chicago 14, Illinois

Once a dreary attic ...now a cheerful room!

You can turn unused space into a room as beautiful as this with Gold Bond Insulation Planks and Tiles—even if carpentering is a mystery to you.

WALLS GO UP FAST because Gold Bond Insulation Planks are light, easy to handle. Place them vertically, horizontally, diagonally. Nail or staple 'em up. Interlocking edges hide the fastenings. Planks have flame-resistant finish—in ivory or in a random assortment of four harmonizing colors. They keep you warmer in winter, cooler in summer, too!

FOR THE CEILING use handsome Gold Bond Insulation Tiles. Easy to nail or staple. They absorb sound just as the Insulation Planks do.

SEE YOUR GOLD BOND DEALER NOW for the materials you need. He'll even help you with easy terms.

NATIONAL GYPSUM COMPANY
Buffalo, N. Y.

Mail the coupon today for Gold Bond "How-to-Do-It" Plan #14 ...complete illustrated instructions that show how you can build a room just as attractive as this.

MAIL THIS COUPON TODAY!

National Gypsum Co., Dept. PS 66, Buffalo 13, N. Y.

Please send me Gold Bond "How-to-Do-It" Plan #14, giving complete instructions on how to apply Gold Bond Insulation Planks and Tiles.

Name_____

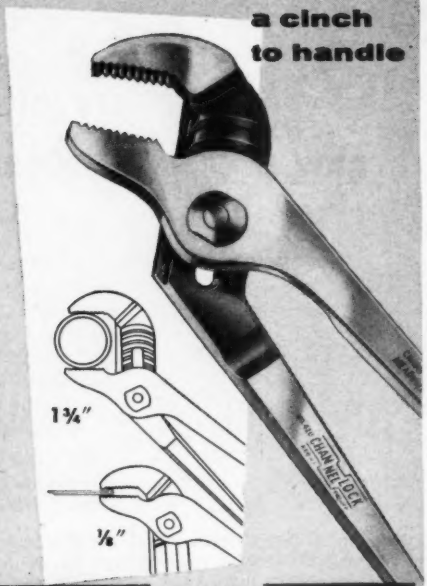
Address_____

City_____ Zone_____

County_____ State_____

grips like a pipe wrench

a cinch to handle



CHAN NEL LOCK ®

No. 420

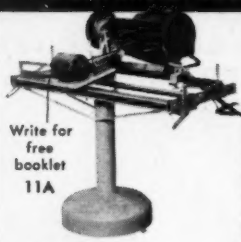
Terrific gripping power on any shape ⅛" to 1¾" size. Long and streamlined . . . easy to use in hard-to-get-at places! Some of the reasons why Channellock is the favorite plier of craftsmen everywhere. And Channellock will be your favorite, too . . . for the same reasons. No other plier does so many jobs so well. Ask your hardware man for a Channellock No. 420.

BE SURE IT'S A GENUINE CHANNELLOCK

CHAMPION DEARMENT TOOL CO. MEADVILLE, PA.

MORE $ $ $ PER HOUR WITH

MODERN IMPROVED LAWNMOWER SHARPENER



Write for free booklet 11A

Compare Before You Buy

Grinds All Reel Type Mowers Hollow Grinds or Flat Grinds Bed Knives

Engine, oil, or gasoline are not removed from power mowers. Wheels, handle and roller remain in place.

Moderns precision grinding assures repeat business.

100% Steel Construction

Faster—Easier to operate

NO CHANGE IN PRICE FOR OVER 10 YRS.

$263.00 Complete with ½ H.P. Motor f.o.b. Pasadena, Calif.

MODERN MFG. CO.

160 N. FAIR OAKS, PASADENA, CALIF.

ENJOY TRAVELING WITH AMERICA'S FINEST AUTO COMPASSES

TRAVELITE (ILLUMINATED) $5.95

GUIDEWAY (NON-ILLUMINATED) $4.95

ONLY COMPASS APPROVED BY AUTO MAKERS

DINSMORE...

Shows you the right way — the short cuts. Always accurate and dependable anywhere. Fits all cars. Send for free folder — "Pants, Knives and Compasses" and name of nearest dealer.

DINSMORE INSTRUMENT CO., 1014-31 Kelso Street, Flint 1, Mich.

CUT EXACT CIRCLES CURVED PATTERNS

"ARCO JIG-SAW"

$10.95

with **Circle-Cutter** (up to 20" dia.) & **Rip Gage** fits **any** ¼" drill. Has speed of $55 saws. Cuts 2x4's, plywood, metals, etc. Incl. blade. **At your dealer** or try it on our **10-day trial.** Sendcheck, M.O. (ppd.) C.O.D. + post.

ARROW METAL PRODUCTS CO., Dept. PS-6, 140 West Broadway, N.Y. 13, N.Y.

JEEP OWNERS

STA. WAGONS • JEEPSTERS • PICK-UPS!

RE-POWER NOW with a Ford 6 or 8 cyl. engine. Our F-J ADAPTOR-CONVERSION KITS fit ALL Willys Jeeps incl. 1956. Kit No. 4-K for 1949-56 Ford engines in 1954-56 Mod. 6-226 Jeep Sta-Wgn & Trucks priced at $52.85 incl. Fed. tax. Kits for 1932-56 Ford engines in all other Willys Jeeps . . . $43.25 tax incl. Instructions furnished. Write for free details or send check or M.O. for prepaid shipment. Please indicate year engine you will use and whether 2 or 4 Whl-Dr. Order NOW.

HOOSIER MACHINE PRODUCTS CO.

314 S.E. 6th St. Telephone No. 676 Pendleton, Oregon

BOAT KITS 28 MODELS-8 to 19 ft. $39 up-FREE FREIGHT

SAVE 2/3!
Easy-to-build
MAHOGANY
DECKS & FRAMES
SEND 10¢ for CATALOG
Includes Hardware-Trailers-Fiberglas

Boat Plans-Patterns-Frame Kits

Build over 50 modern boats from large scale plans, available with FULL-SIZE patterns, new PRE-FAB frame kits! All types: prams to cruisers, 6 to 25 ft. Best buy for Ameteurs! SEND 10¢ for CATALOG.

Craig-Craft Tonawanda, N.Y.

The POWER TO STOP can save your life!

Once you've tried Bendix* Power Brakes—and marveled at the difference they make in stopping ease—you'll demand them for your present car, whatever its make. Ask for a test ride today. Car dealers, better garages, service stations and brake shops across the country have cars equipped with Bendix Power Brake Demonstrator Units. When you've seen the difference, *felt* the difference, you'll know they're the finest automotive buy on the market. And get this: Average price—about $60 (including installation)!

*REG. U.S. PAT. OFF.

Bendix POWER BRAKES

Bendix Products Division, Bendix Aviation Corp., South Bend, Ind.

WELD BRAZE SOLDER CUT

4 WAY ONLY $14.75 f.o.b. factory WELDER

Complete with Twin Carbon Arc Torch and accessories . . . to handle all metal-craft work.

Acclaimed by thousands of Homeowners, Mechanics and Hobbyists as the welder of 1001 uses. Easily operated from properly wired 110 volt AC or DC line. The ideal gift with a life-long use . . . Order today on 10 day money back guarantee.

FOUR-WAY WELDER CO., Dept. F3-F
1810 S. Federal St. • Chicago 16, Ill.

Also Eshelman Adult 2 Pass. SPORT & GOLF CARS 1/5 the Price of most other Cars. 70 Miles Per Gal. FREE CATALOG write:

ESHELMAN TRACTORS LOW AS $99

Rakes • Plows • Cultivates • Saws • Dozer • Harrows • Snow Plow • Rolls Sprays • Hauls Mows • Cuts • Tills

Eshelman Tractors, Tillers, Riding Rotary Mowers for Better Lawns and Gardens. Advertised in GOOD HOUSEKEEPING. Thousands of satisfied users.

2 to 8 HP

Shipping Points: BALTIMORE • CHICAGO • RENO

ESHELMAN, Dept. R-46, 109 Light St., Balto. 1, Md.

PUMP WATER *FAST!*

Drains Wash Tubs, Cellars, Cisterns. Famous #7 pumps 4000 gph 700 gph at 95' high, or 2400 gph from 25' well. Sturdy rustproof alloy metal. Six blade impeller. ¾" inlet, ½" outlet. Standard pipe threaded. Uses any ⅙ to ½ H. P. Motor. Will not leak or clog. Ironclad guarantee. Send check, M.O., or sent C.O.D. $6.95 MLS.

Irrigate, Fill Tanks, Draw Well Water. Heavy duty #8 pumps 9500 gph 1200 gph. 95' high 5000 gph from 25' well. Rustproof alloy metal. 8 blade impeller. 1" inlet, 1" outlet. Standard pipe threaded. Will not leak or clog. Iron clad guarantee. Send check, M.O., or sent C.O.D. $11.95 MLS.

Free Catalogue—Gear Pumps, Large Centrifugal Pumps, Deep and Shallow Well Pumps, Sump Pumps.

MOORE MANUFACTURING CO.
SWEDESBORO 2, NEW JERSEY

SO EASY TO USE...

SO POWERFUL . . . SO DURABLE! *and*

SYNCRO POWER UNITS GUARANTEED AGAINST BURN OUT DURING YOUR OWNERSHIP OR REPLACED FREE!

Model 900 Heavy duty. Outsands, outlasts others. Exclusive "No jumping," Multi-Motion sanding action. $39.95

Model 504 Light. Powerful. Easiest for vertical use. America's greatest finish sander. $19.95

SYNCRO SANDERS Feature the Modern Syncro Reciprocating MOTOR . . . today's greatest achievement of all electro-mechanical research! Powerful! Smooth! No cams, belts or gears. No rotating parts to wear out. No brushes to burn out. See sanders at stores. Write Syncro for Free catalog and sanding handbook.

MULTI-MOTION SYNCRO SANDERS

SYNCRO CORPORATION
Dept. 2-A6
OXFORD, MICHIGAN, U. S. A.

WORLD'S LARGEST MANUFACTURER OF RECIPROCATING MOTORS

WHY SWELTER?

Enjoy...An Air-Cool House EVEN WITHOUT AIR-CONDITIONING

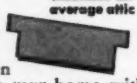
Of course an air conditioning unit does the best cooling job. But if you aren't ready for such an expensive improvement now... *insulate with* ZONOLITE. A Zonolite-insulated house is as much as 15° cooler in summer. Helps you enjoy wonderful, cool comfort during summer's hot spells—*and saves up to 40% on winter's fuel bills!*

INSULATE WITH ZONOLITE®

DO-IT-YOURSELF IN JUST *HALF-A-DAY*...

Easiest of all insulations to install. Lightweight! Pours into place! Anyone can do the job in 3 or 4 hours. Zonolite vermiculite is 100% fireproof—permanent, rodent-proof, rotproof.

As low as **$67.60** Insulates an average attic



The Only Tool You Need... FREE at your Dealer!

See your dealer for a free estimate on how economically you can insulate *your* home with Zonolite. Then pour it...level it with the tool that's free...and you're insulated for the life of the building. That's *guaranteed in writing at dealers!* Mail coupon today for free "How-to-do-it" booklet.

ZONOLITE® INSULATING FILL

OPERATION HOME IMPROVEMENT

Send for DO-IT-YOURSELF booklet

Zonolite Company, Dept. PS66
135 So. La Salle St., Chicago 3, Ill.

Please send me free booklet HI-47 telling how I can have an air-cool home...even without air conditioning.

*Name*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

AT LUMBER & BUILDING SUPPLY DEALERS

RIDE and MOW with the SHAW DU-ALL

Model *RM* 24 (24" cut)
or
Model *RM* 32 (32" cut)

Biggest little mower on the market!

LOW PRICE, too. Great for estates, farm and suburban homes, parks, cemeteries, etc. Trims smartest lawn; or tallest grass, turning radius only 45 inches. Sturdy 2½ to 3 H.P. air-cooled engine. 110 volt starting motor plugs into house current (optional). RM 32 is 6 H.P.

WRITE TODAY for free folder, prices, and full details. Also walking and riding tractors, 1½ to 12 H.P.

SHAW MFG. CO. 5706 Front St., Galesburg, Kansas
668-P6 N. 4th St., Columbus, Ohio

½-HP Motor SPEED REDUCER

Reduces Speed at a 20-1 Ratio

Brand New! Guaranteed! Gov. Cost $86

ONLY **$16.50** Ppd.

Mfr'd for Army radar equipment, this reducer is a masterpiece of design and precision workmanship. For experimental and laboratory uses . . . for building special equipment that saves valuable man hours. Ratio of 20-1 gives approximately 90-RPM with 1750 motor, direct drive . . . or can be belt driven to give ANY DESIRED SPEED! Use with any size motor up to ½-HP. Case is cast of aluminum alloy (not die cast) and has BALL BEARINGS throughout. Heavy duty, double reduction, spur gear drive built for continuous duty. Smooth, quiet running. Base to shaft is 4¾" high. Comes complete with couplings. Operates conveyors, timing devices, revolving window displays and signs, tumbling equipment and machine tool drives . . . 1,001 uses! Order From AD! We Pay Shipping!

ROBERTS ELECTRIC CO., Dept. PS-468, 849 W. Grand, Chicago 22, Ill.

Loosens Rusted Bolts

nuts, screws, "frozen" parts!

LIQUID WRENCH

AT HARDWARE STORES, GARAGES SERVICE STATIONS EVERYWHERE

For information write manufacturer

Radiator Specialty Co., Charlotte, N. C.

MITEE WELD Electric Welder

Do your own repair work at home with MITEE-WELD. Easy welding of ⅛" metal. For machine parts, tools, fenders, tanks, etc. Comes with rods, eye shield, directions, works on AC or DC. 110 Volt. Guaranteed or money refunded. $6.95 plus 50c postage. Flame torch accessory for cutting, brazing, soldering $3.95. Includes brass rods, carbons, flux. $1 deposit on C.O.D. orders.

ONLY **$6.95**

MITEE MFG. CO., Dept. 340
1813 S. Clinton St., Chicago 16, Ill.

Everything You Need For

UNDERWATER

Sports and Adventure

DIVEMASTER

SKIN AND LUNG DIVING EQUIPMENT

Leading nationally known and foreign made products. Inspection tested at money saving prices. Underwater Breathing Apparatus, Swimming Masks and Fins, Diving Masks, Spear Guns, Water Skis, Diving Suits, etc. **Send 25c for Illustrated Catalog.**

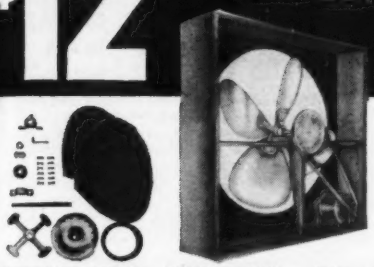
(Dealer Inquiries Invited)

U. A. S. CORPORATION, Dept. PS-56
5637 W. 63rd Place, Chicago 38, Ill.

30" FAN!

$12.50

BUILD IT YOURSELF SAVE 80%



ASSEMBLE YOUR OWN FAN—IT'S EASY

The biggest fan value in the country. Enjoy a breeze all summer and save up to 80% by assembling your own fan. Kit gives you easy to follow instruction sheet plus all necessary precision parts less lumber and motor. Use as attic or window fan. Money back guarantee.

30" fan cools average home.....$12.50
24" fan cools small home.....$11.50
20" fan cools apts., offices, etc.....$11.00
Larger sizes available on request.

Send check or money order. Shipped postpaid continental U.S. $3.00 deposit on C. O. D. Free literature.

THE FAN HOUSE 866 Camp St., New Orleans 12, La.

NEW Catalog

x-acto
KNIVES • TOOLS • KITS
for every hobby, art & handicraft

Designed by craftsmen and precision-made to the highest quality standards.

Write today for our 28-page, fully illustrated catalog—only 25c.

x-acto, Inc.
48-47 Van Dam Street, L.I.C. 1, New York

A PRECISION LEVELING INSTRUMENT *for only* $12.95

With the New LEVELALL one man can do the work of two men and a transit, quickly, easily, accurately. All alone you can speedily level points for footings, forms, piping, batter boards, sills, lintels, floors, ceilings, roads, driveways, lawns — any type of construction work. Send for Free booklet or, better yet, order a DeLuxe Levelall today.

*Name*_____
*Street*_____
*City*_____ *Zone*____ *State*____

☐ Mail 75' DeLuxe Levelall @ $12.95 ☐ Regular 50' model @ $9.95 ☐ Ship postpaid full price enclosed ☐ Ship C.O.D. Money-back satisfaction guaranteed.

LEVELALL 81F Webster Street, Rockland, Mass.

H-W-R stops hydraulic lifter noise . . . keeps your engine clean, restores power . . . gives smoother, quieter performance . . . rids automatic transmission of jar and jerk. Results guaranteed or *Double-Your-Money-Back!*

HASTINGS MANUFACTURING CO., HASTINGS, MICHIGAN

HASTINGS

Buy these Hastings Products with confidence:
H-W-R, Casite, Piston Rings
Oil Filters, Spark Plugs

now! assemble your own

ALUMINUM SCREENS

save up to **50%**

LIFETIME PROTECTION—

YET IT'S ONLY *MINUTES* FROM PARTS TO FINISH WITH

HOMESHIELD®

easy-to-make SCREEN KITS

Make your work shop pay off! Assemble these maintenance-free aluminum window screens for your home, cabin, or shop and save money...make 'em for neighbors, apartment houses or businesses, and make money! It's a simple assembly job that requires no special tools.

No more repairing or repainting! Replace heavy, old-type screens or screen your new home with sparkling Homeshield screens that'll dress up your home for life.

Eliminates rust and stained walls. Lightweight—install or remove in a jiffy. No ladders needed.

Kits are complete with sturdy aluminum frames, easy-to-handle Fiberglas® screening, corner locks, installation hardware — even a miter box. Sizes for full screens and sliding half screens (and storm sash, too!) Ask your department store, hardware or lumber yard dealer, or mail coupon for folder and name of nearest Homeshield distributor.

AMERICAN SCREEN PRODUCTS CO.
Dept. PSK-6, 807 N.W. 20th Street, Miami, Florida

Name.....

Street.....

City.....State.....

DO IT BETTER...

DO IT WITH DP®

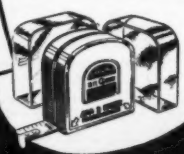
SEAL
CAULK
GLAZE
PATCH

Here's the answer to **dozens** of repair problems around the house: **D-P White Wonder Sealing Compound** . . . in a handy dispenser tube! For filling cracks in woodwork, around sinks, tubs, lavatories. For replacing loose or broken tiles. It's moisture-proof, heat-resistant . . . easy to work and stays put! At all good stores!

Ask your dealer for D-P Products.

THE DICKS PONTIUS CO.
5301 Huberville Ave., Dayton 3, Ohio
INSIST ON D-P BEST SINCE 1867

6-ft. only **$1.49**



Insist on *Evans*

TAPES "KING-SIZE"

At your hardware store

STANDS UP STRAIGHT

EXCLUSIVE! Belt clip for handy carrying.

Also available in 8, 10, 12-ft. lengths with free plastic utility case.

EVANS RULE CO., Elizabeth, N. J.

24" ATTIC FAN KIT

Easy to assemble. Belt-driven. Blade, shaft, 2 self-aligning bearings, 2 pulleys, 2 collars, and V-belt. Everything you need, except frame and ¼-hp. motor, to make your own house cooler.

ONLY **$9.95**

SAVE $40.00

MEDFORD MFG. CO.
MEDFORD, N. J.

send for FREE tool catalog

A big, fact-packed catalog full of pictures and tool information . . . yours for the asking.

- *Snap-on* tools help you handle repair jobs faster, easier, better.
- *Snap-on* tools LAST . . . pay for themselves over and over.
- Used and endorsed by America's top-earning mechanics in all fields.
- Start building your *Snap-on* set with basic units . . . add other tools any time.

SNAP-ON TOOLS CORPORATION
8060-F 28th Avenue, Kenosha, Wis.

Send me free catalog.

OCCUPATION .....
NAME .....
ADDRESS .....
CITY .....ZONE .....STATE .....

Snap-on Tools
THE CHOICE OF BETTER MECHANICS

NEW Easy-to-Use SOLDER

Solders in ONE operation... just apply Swif and heat

SWIF is a real 50/50 tin-lead solder in paste form with flux combined. Just apply Swif and heat. All extra preparatory steps are eliminated by its one-step cleaning, tinning and soldering action. It makes perfect soldered connections with the heat of a match, torch, or soldering iron. Tube holds enough Swif for hundreds of jobs. Swif has been used by professional plumbers for years. At hardware, hobby, plumbing and auto stores. 59c per tube. *Send For Free Literature.* (Slightly higher in Canada.)

HERCULES CHEMICAL CO., Inc.
416 B'way., New York 13, N. Y.

New Black & Decker 6½" Heavy-Duty Saw cuts 2x4's at 45°!

$64.50 Extra Capacity • Extra Power • Extra Safety • Extra Convenience • Extra Adjustment Features

See your B&D dealer for demonstration today! THE BLACK & DECKER Mfg. Co., Dept. S-66, Towson 4, Md.

"PROJECTS FOR OUTDOOR LIVING"

NEW DELTA hard cover book features dozens of outdoor projects. Clear illustrations, complete bills-of-materials, easy-to-follow plans. Only $1.00. Also get FREE folder on complete Delta Library: Delta Power Tool Div., Rockwell Mfg. Co., 504F N. Lexington Ave., Pittsburgh 8, Pa.

SUPER-LIGHT LEVEL
HAS MAGNIFIED VIALS!

EMPIRE ACRA-LITE No. 1521

A craftsman's dream! Acra-Lite Magnesium Level is ONE THIRD Lighter — for easier, faster handling. Easier to read, too. Super-accurate vials have "Full-Vue" *magnifying* cover plates. Get YOURS today — at your dealer, or order direct.

New Empire Acra-Lite Magnesium Level No. 1521,
24" Only $6.70 — 28" $7.60 — 48" $13.50

EMPIRE LEVEL MFG. CO.
10930 W POTTER RD., DEPT. PS, MILWAUKEE 13, WIS.

PAINT SMOOTHER, EASIER with
Brushes by Baker!

Use Baker Brushes and paint easier, faster, better! Enjoy smoother painting, use fewer strokes, get more coverage. Next time you paint choose the right Baker Brush size most practical for the job.

learn to paint like an expert . . .

Free booklet tells "HOW TO DO A GOOD PAINT JOB." Today, send card to Baker Brush Co., Inc., 83 Grand Street, New York 13.

BRUSHES BY BAKER

AMERICA'S FINEST PAINTING TOOLS

GIGANTIC SAVE-TO-70%

MAIL SALE

WAR SURPLUS EXCESS INVENTORY BANKRUPT STOCK

WEED SPRAY OUTFIT

● Leading make. Latest design. 5-row (17') P.T.O. tractor drive finest pump. T-jet nozzles, precision controls, gauges, hose. Complete. List $175.00. Postpaid in U.S.A. **$97.65**

FREE big weed spray catalog.

EXTRA SPECIAL OFFERING!

GIANT ARMY BOX KITE

Order Now—only 100 Available!

Approx. size 14'x10'x3'

Weighs 25 lbs!

● During war these huge kites were towed behind ships on long cables to entangle enemy aircraft—also used over London.

● Made of a very strong, light silken fabric. Prefabricated light weight wood frame. Unit is shipped knocked down. Can be assembled in 15 minutes—disassembled in two!

● Takes off without towing in any wind that will support ordinary small kites. **MANY USES!** Ideal for spectacular advertising, Radio-TV antenna experiments, Boys Club aviation studies, aerial photography. Can be used to pull small boats. Pull on towline varies from 50 to over 100 lbs., depending on wind. Use any strong non-metallic cordage towline. Full instructions. Est. Gov't. Cost Over $125. Special F.O.B. Lincoln **$14.21**

ARMY POWER PLANTS

● Marvelous buys in new condition genuine Gov't. surplus plants and generators. We pay freight on most of the units.
● 1000-w. 115-v. 60-c. **$149.50** ● 2000-w. 115-v. 60-c. **$269.50** ● 3000-w. 115-v. 60-c. **$299.50** ● 5000-w. 115-v/230-v. 60-c. **$497.50** ● 25 kw. $6000 plant. **$2100** (FOB)

Many other Bargains. Send for Free Catalog.

IRRIGATION PUMPS

● New finest Navy surplus. Standard makes.
#1-2½" Centrifugal, 280 gpm. Prepaid **$44.37**
#2-1½" Centrifugal, 140 gpm. Prepaid **$24.61**

Many other pump buys. See our Catalog.

HYDRAULIC BARGAINS

Savings to 80%. Build-repair loaders, diggers, presses, etc. Valves, gauges, cylinders, etc. Marvelous values!

● **Control Valve,** 1 or 2 way (Specify) **$18.00**
● **Pump,** 1000 lb. 12 gpm. **$45.50**
● **Cylinder,** 2"x10", 3000 lb. lift.... **$17.50**
● **Servo-Cylinders,** 4" stroke.....pr. **$5.95**

Many other Hydraulic items—see Catalog!

Miscellaneous SPECIALS

● **Navy Bomb Hoists** (1000 lb. cap.) . **$29.95**
● **Magneto Wall Telephones**..... **$9.95**
● **Surveyor's Level and Tripod**..... **$42.95**
● **Air Power Tree Trimmer**..... **$15.37**
● **AC-DC Power Rectifier** (FOB)..... **$15.61**
● **Gear Head DC Motor** (6, 12 volt) .. **$8.72**
● **One-Two Man Navy Rubber Boats** .. **$27.92**

SPECIAL OF THE MONTH!

Golf Car Battery Motor

Genuine Gov't. Surplus

900 Available

● Powerful gear reduction slow speed-high torque battery motor. Runs on 6 to 24 volts. Speed 150 to 500 rpm. Uses ordinary car storage battery.

BUILD MANY ITEMS—
● Self-propelled golf car
● Warehouse personnel cars
● Store lift trucks
● Electric boat or truck winch
● Garage door opener
● Invalids wheel-chair
● Farm wagon unloader

Dozens fascinating, useful, very practical applications.

SPECIFICATIONS — Consists of powerful storage-battery-type ball bearing motor with fine precision built-in gear reduction. Output shaft ¾" diameter.

● Exceptionally high torque. Will pull two men in golf car at speeds up to 7 mph. Units cost gov't. over $200. Precision built—will last for years. Economical—require minimum battery charging.

● Order Now. Free instructions furnished. Wt. 34 lbs. Gov't. cost over $200 Special F.O.B. Lincoln..... **$19.46**

ORDER FROM AD or write us for big **FREE CATALOG** 1000s of items! Motors, sporting goods, hand and electric tools, watches, tarps, etc., etc. We pay freight except where stated "F.O.B."

FREE CATALOG

BURDEN SALES COMPANY

828 "O" St., LINCOLN, NEBRASKA

KEEP ALL SAWS SHARP

SO EASY! With this new filing jig and jointer anyone can now sharpen any handsaw like new! When file hits hardened steel rollers teeth are finished and EXACTLY SAME HEIGHT. All teeth cut and saw runs true and smooth. Jig and instructions **$2.95** postpaid. Free literature.

SAVE TIME AND $$

JOINT & SHARPEN CIRCULAR SAWS

Sensational New Super Filer No. 11 joints and sharpens both **hand** and **circular** saws 6" to 10" with all teeth the correct height, depth, pitch and bevel. Easy to use—when file hits hardened steel roller, teeth are finished. Saw runs true and smooth with no side pull. Complete with special 8" file **$9.95 ppd.** **"TRU-CIRCLE"** saw set automatically sets teeth at 10° or more **$2.95.**

Guaranteed

SUPER SAW FILER NO. 6

Automatically controls

SUPER DRILL GRINDER

Sharpens round shank drills from 3/32" to ½" in diameter, up to 6" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels **$2.95**

DEPTH ANGLE PITCH

Automatic DEPTH CONTROL Rollers

IT'S NEW

Perfect bevel and angle maintained, and fool-proof depth control for all Rip, Crosscut and Handsaws. Precision made and calibrated for instant setting at desired angle. Can be used in any vise or clamp. Complete with file, only **$6.50 PPD.**

SEND FOR FREE CATALOG

A. D. McBURNEY, 5908 Hollywood Blvd., Hollywood 28, Cal., Dept. S-66

CONVERT CAR RADIO to HI-FI

only $9.95 ppd.

New, rear seat speaker kit converts any car radio to true hi-fidelity reproduction. Speaker has 6x9 woofer, 2" tweeter cone and chrome trim. Three way selector switch and plate is easy to mount, has no holes to drill, will play front, rear or both. Kit is complete with wire and instructions, installs in 30 minutes. Only $9.95 postpaid. Money back guarantee.

TELE-RAD ELECTRONIC LAB

3454 East 93rd St. Cleveland 4, Ohio

Lubricates and Protects Aluminum Windows and Doors

TRAX WAX

59¢

AT LUMBER AND HARDWARE DEALERS

product of the weather-proof co. Cleveland, Ohio

Guaranteed original equipment Replacement Auto Parts . . . at Western Auto

---

Get New 128 Page Catalog of

WOOD AND WOODWORKING MATERIALS

WORLD'S LARGEST SELECTION—Lowest Prices

Your buying guide for finest kiln dried domestic and rare imported woods, inlays, bendings, matched plywood, mouldings, ornaments, etc. Biggest selection of tools and hard-to-find hardware. Packed with scroll saw patterns, projects, wood facts and money making ideas. Enclose 25¢ (refunded on first order) to help pay mailing and handling costs. Write today to

CRAFTSMAN WOOD SERVICE CO.

2729 S. Mary St., Dept. B-6, Chicago 8, Ill.

WELD IT YOURSELF IN A JIFFY!

Weld, Cut, Braze, Solder; Iron, Steel, Brass, Bronze, Aluminum and other metals safely and easily. Make your wrought iron furniture, porch railings, fences, knick-knacks and other metal specialties. With this fine equipment anyone can do professional-like work with little practice. The Dynamic is an industrial type transformer arc welder designed to operate from any properly wired 110 volt AC line.

NOW as a SPECIAL OFFER you will receive an $8.00 Twin Carbon Arc Torch FREE to complete your welding workshop. Order TODAY!

Literature on larger equipment available on request.

EASY PAY PLAN

Low down-payment. Pay as you weld. Money back guarantee. Complete outfit including special GIFT.

***Only* $38.50**

F.O.B. Factory

DYNAMIC WELDER COMPANY, 1808 S. Federal Street, Dept. D3-F, Chicago 16, Illinois

Speedy Sprayer

mobile paint sprayer

Choice of craftsmen for 35 years! Saves time, paint and money. Quickly gives flawless finish to walls, furniture, screens, fences and handiwork. Sprays all materials; ¼ H.P. motor. Diaphragm principle assures clean, oil-free air. Never needs lubrication. With gun, less motor.

No. 890 Speedy Sprayer $38.50

Add wheels with Wheel Kit No. 909. Includes 6" wheels, handle, fittings. $6.95

FREE! Write for "How to Spray" Booklet and Literature.

At dealers everywhere

W. R. BROWN CORPORATION
2637 N. NORMANDY AVE., CHICAGO 35, ILLINOIS

IMPERIAL RAPID BRUSH CLEANER
For HARD-CAKED brushes

Acts instantly—no long soaking. At paint and hardware stores.
Wilson-Imperial Co., 121 Chestnut St., Newark 5, N. J.

NEW, IMPROVED CALCULATOR FOR WOODWORKERS only 25c

Instantly gives information on lumber, nails, concrete mixes, painting materials, etc. Convenient, simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of woods. 6" diameter heavily varnished cardboard. Send 25c, no stamps, please to Greenlee Tool Co., 2126 Columbia Avenue, Rockford, Illinois.

FREE New FAN—Shutter—Motor—Catalogue

Packed with the Largest Selection of Fan equipment.
BUY FROM MFR and SAVE MONEY
Fantex and Torrington Blade Kits.
Attic Fans • Exhaust Fans • Pedestal Fans
Window Fans • Shutters • Motors • Tub Enclosures
Sewing Machines • Awnings • Home and Industry Supplies
Visit us or Send for Free Copy Today

16" ATTIC OR WINDOW FAN KIT
Includes Steel Blade—2 Pulleys—2 Bearings—2 Collars—Shaft—Instructions—Easy assembly. Enclose Postage with order (Wt. 7 lbs.)
Dealers Invited
Reg. Pr. $15.90
Sale Price $7.95

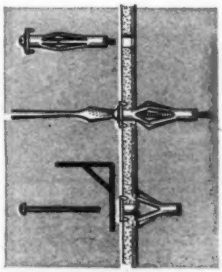
ALBIN MACHINE Write Dept. S
N.Y. 423 Broome St., N.Y. 13
Detroit 14030 W. 6 Mi., Mich. 35
Louisville 710 W. Market, Ky.

A fastener that grips fixtures to walls quickly, securely...

★STAR WALLGRIPS

REPLACEMENT OR REFUND OF MONEY IF NOT AS ADVERTISED THEREIN
Guaranteed by Good Housekeeping

makes any fixture-hanging job a simple task. Fixtures can be quickly removed or replaced when redecorating without disturbing the WALLGRIP. Send for new booklet "The Hang of Things", showing how to fasten all kinds of fixtures to any type of wall.



How WALLGRIPS work in hollow walls:

1. Insert in Hole. Wings spread as bolt is tightened.
2. Positive Stop tells WALLGRIP is set.
3. Remove bolt and replace through fixture and tighten.

★STAR EXPANSION
Fasteners for Home and Industry
Dept. PS-6, 142 Liberty Street
New York 6, N. Y.
Please send me a FREE copy of the book "The Hang of Things".

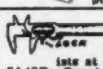
Name_____
Address_____
City_____ Zone____ State____

WAR SURPLUS AND OTHER BARGAINS SAVE UP TO 90%

BUILD YOUR OWN ARC WELDER, LIGHT PLANT OR BATTERY CHARGER

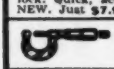
Complete Kit $39.95

Kit consists of: 1 Famous Navy NEA-5 Generator. New! Combination AC-DC Type. AC voltage—115 V. DC voltage—24 V. 200-300 Amps. 2 complete generators in 1 . . . 2 separate fields & 2 separate armatures on same shaft yet no larger than reg. aircraft generator. Ideal for home, farm & shop lighting plants by hooking wires to AC side which will give 1200 watts. DC side can be used for charging batteries, welding & operating war surplus low voltage hobby motors & equipment. Also in kit: 1 Voltage Regulator DC. 1 Voltage Regulator AC. 1 Reverse Current Relay. 1 Ammeter, 1 Shunt, 0 to 240 Amps. 1 Voltmeter, 0 to 30 Volts. 1 Rheostat. 1 Electrode Holder. 1 Giant Toggle Switch. Wiring diagram for hookup as welder. Wt. under 100 lbs. Approx. GOVT. COST $600. Kit, only $39.95. Navy NEA-5 Generator (only)—same as above . . . if purchased separately: New—$27.50.



"HELIOS" ORIGINAL TOOLMAKERS VERNIER CALIPERS

ULTRAPRECISION — Imported. Used by machinists at Lockheed, Douglas, Bendix, GM, RCA, GE. Model 51/2E. Genuine Helios. Hardened lapped precision surfaces. 1/1000" and 1/128" graduations. Handy slide roll and thumb lock. Quick, accurate depth. A $35 value. De Luxe finish. ALL NEW. Just $7.95. Leather carrying case. $1 extra.



MICROMETERS Chrome plated, precision engineered, carefully tooled to give long life. All new 0-1" cap. $2.25 ea., 1-2" cap. $3.50.

PRECISION GROUND SQUARES

Production engineer's squares. Accuracy guaranteed. Mfd. by Wright & Moore, Sheffield, Eng. Square blades, hardened & tempered. Brand NEW. Fraction of original cost. 2"—$2.75, 3"—$3.00, 4"—$3.25, 6"—$3.75, 9"—$7.00, 12"—$8.75.

PIONEER MAGNETIC COMPASS

For boats, trucks, cars. By Pioneer Instrument Co., Div. of Bendix. No. 1829-2A. Contains screw-type heeling compensator, removable drawer-type compensator, screw-type horizontal compensator and spider-type compensator. All devices for elimination of errors caused by effects of magnetism. Has constant deviation corrector and course setter. Rotable dial engraved with compass card graduations. Complete with book of instructions, light and mounting screws and shock mounts. Shpg. Wt. 10 lbs. Approx. GOVT cost $400. NEW. $13.95

NEW! 1956 CATALOG Largest ever . . . just out . . . new low prices. Send 25c for your copy today. Prices F.O.B. Culver City unless otherwise stated. Check, cash or money order. 25% deposit for C.O.D.

AIRBORNE SALES CO., INC. DEPT. PS 656
8501 Stellar Drive, Culver City, Calif.

BUILD YOUR OWN POWER TOOLS—

PLANS only $1.00 EACH POSTPAID

With GIL-BILT PARTS-PLAN KITS

10" TILT/ARBOR SAW

Sturdy wood, steel, and aluminum construction. NEW DEPARTURE ball bearings. Capacity and performance of floor saws selling for $150.00 and up. Plans, all metal parts in kit with 10" comb. blade $25.90, less blade $22.95, F.O.B. St. Louis. Detail PLANS-PATTERNS only $1.00 postpaid.

12-IN. BAND SAW

Ball bearing drive, rigid cast aluminum wheels, rubber tires. Handles stock up to 6 inches thick. Cuts to center of 24" circle. 18 x 18 inch tilt table. Capacity and performance of band saws selling for $80 and up. Plans and all metal parts in kit with 1/4" blade $23.95. Detail PLANS-PATTERNS only $1.00 postpaid.

For shipments up to 600 miles, add 5%; over 600 add 10%. Amount in excess of actual postage will be refunded.

Also Build-it-yourself 18" Band Saw, 6" Belt Sander, Shaper, 8" Tilt-Table Saw. Simplified plans, build easily with hand tools only. Advertised and sold for 8 years, over 30,000 units in use. Money back Guarantee. FREE CATALOG.

GILLIOM POWER TOOLS Dept. 70-F, Lambert Field St. Louis 21, Missouri

"SPEEDY" DRILL GRINDING GUIDE

MAKE OLD DRILLS LIKE NEW...

For repointing dull and broken twist drills up to 1/2" in diameter. One piece cast Aluminum. Simple. Anyone can use it. Order yours to-day. $1.00 postpaid.

BRASS CASTING CO. P. O. Box 3036 Memphis 9, Tenn. $1.00 POSTPAID

Also Eshelman Adult 2 Pass. SPORT & GOLF CARS 1/5 the Price of most other Cars. 70 Miles Per Gal. Free Catalog.

ESHELMAN TRACTORS

LOW AS $99

Shipping Points: BALTIMORE • CHICAGO • RENO

For Better Lawns and Gardens investigate Eshelman Riding Rotary Mowers, Tillers, Tractors. Advertised in GOOD HOUSEKEEPING. Thousands of satisfied users. Free Literature Write:

ESHELMAN, Dept. M-46, 109 Light St., Balto. 2, Md.

THE ORIGINAL PACKAGED BOAT KITS

Made ONLY by Custom-Craft

Top Performance, Design, Styling! Over 70 Models 8 to 21 ft

World's largest line! Over 200 Boats: Kits, Formed-Hulls, Semi & Custom-finished! All types: Prams -Cruisers! Easy to build! Flyingstern, Tredronic bottom, Bulkhead construction!

Send 25¢ for KIT CATALOG

52 pages: Includes Victory Series, hardware, paint accessories, Fiberglas! Send $1.00 for Catalog Plus "Boating Handbook". DEALERS-AGENTS INQUIRE

BOAT PLANS & PATTERNS Frame-Pac Kits

World's largest selection: over 200 plans, full-size patterns, frame-pac kits! Designed strictly for ameteurs! All types: prams, kayaks, racers, runabouts, catamarans, houseboats, cruisers - inboard-outboard 6-40' wood-plywood-steel!

Send 35¢ for PLAN CATALOG

Catalog PLUS "Boatbuilding Handbook" $1.00

CUSTOM-CRAFT - BUFFALO 7, N. Y.

KAKEST MORTAR PLANE

"Amazing New Mason's Tool"

Makes it easy for amateurs to build masonry block walls. Lays smooth ribbon of mortar. Saves time and money. No waste of mortar. Send for FREE Folder.

$13.95 Money Back Guarantee

KAKEST COMPANY Dept. 3 Curwensville, Penna.

OVERLOAD SPRINGS

$9.95 Per Pair postpaid

2000 LB. SIZE $11.95

For cars and trucks. Front and rear. Gives 2000 lbs. extra capacity for all 1/2, 3/4, and 1 ton trucks; 500 or 1000 lbs. extra for all cars. Easily installed. Guaranteed. State make, model. Dealers wanted.

BRINKMAN MANUFACTURING CO. 2315 Clay Dept. 6-E Topeka, Kansas

earn BIG Money arc welding

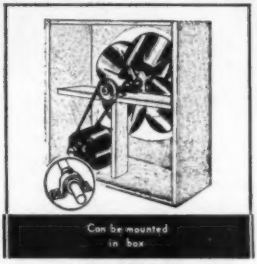
"Simplified" welding the Hobart way helps you earn hundreds of extra dollars. Get the "BIG PAY" jobs—weld, run tools, pumps, lights, etc. with these big capacity, low cost models.

WELDER Plus POWER for running tools, lights, motors

Built-in convenience features enable you to do professional work in your own shop or outside.

HOBART BROTHERS CO., BOX P-66, Troy, Ohio

Make your own Belt Drive Attic or Window Fan!



LESS MOTOR

Model No.	Blade Size	Cu. Ft. per Min.	Rooms Av.	Motor Req.	Retail Value	Your Cost
A20	20"	3000	4	1/4	$19.90	$ 9.95
A24	24"	4000	5	1/4	23.90	11.95
A30	30"	7000	7	1/4	29.90	14.95
STEEL BLADE HEAVY DUTY						
A36	36"	10,000	8	1/3	45.00	22.50
A42	42"	12,500	9	1/3 or 1/2	59.00	29.50
A48	48"	16,300	12	1/2 or 3/4	69.00	34.50

For Ball Bearing Oilless Tafiner Bearing Add $10.00.
Write For Wholesale Prices on Window Air Conditioners
1/2—3/4—1 & 2 Ton.
Also Complete Line 20" Window Fans.

Send check in full with order. Send 25c for wholesale fan and parts catalog with over 100 models to choose from, including name brands.

AGENTS WANTED

EMECO ELECTRIC (Fan Division)

800 W. Randolph St. Dept. 666 Chicago 6, Ill.

NOW—SHOPSMITH®

for as little as **$3 per week**

Start *enjoying* SHOPSMITH now for only $29 down, $3 weekly. Start *saving* now! Savings on projects and home repairs can more than equal weekly payments. See your hardware dealer or Montgomery Ward store. Write for 2 big, free, illustrated books.

SHOPSMITH, Dept. 322-A, Menlo Park, Cal., or Box 2809, Ft. Wayne, Ind.

NEW! Giant AUTOMOTIVE CATALOG

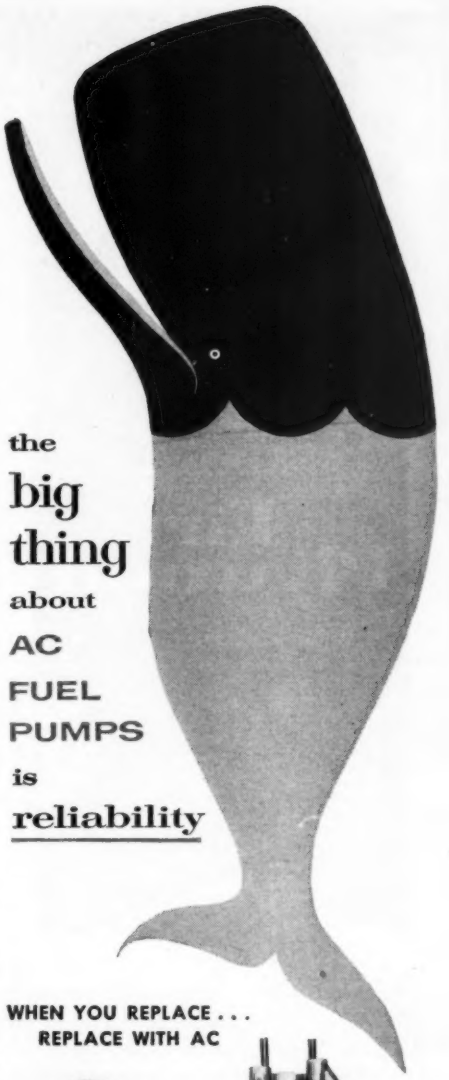
1956 Edition! Everything for car, truck, custom-styled car, hot rod . . . at LOWEST PRICES!

SAVE UP TO 50% on all parts, accessories! Only complete automotive buying guide . . . 75,000 items . . . 180 pages! Thousands of **hard-to-find parts**; equipment, parts for 1920 to 1956 models; **Hollywood accessories** never before offered; **hi-speed parts.** Send your name and address and 25c (refundable with first $5.00 order) to:

J.C. Whitney & Co. 1917 Archer, Dept. T-6, Chicago 16, Ill.

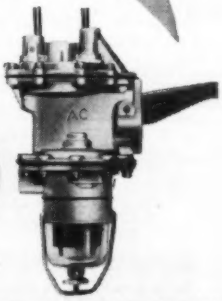
NOW—32 PAGE BOOK filled with photos, drawings, specifications, records, wholesale price, and Rider Agents plan if no dealer near you. Send 25c for book, or send $1 (refunded first order) for it plus actual operating book and service manual.

MIDGET MOTORS MFG. CO., ATHENS 2, OHIO



the **big thing** about AC FUEL PUMPS is **reliability**

WHEN YOU REPLACE . . .
REPLACE WITH AC

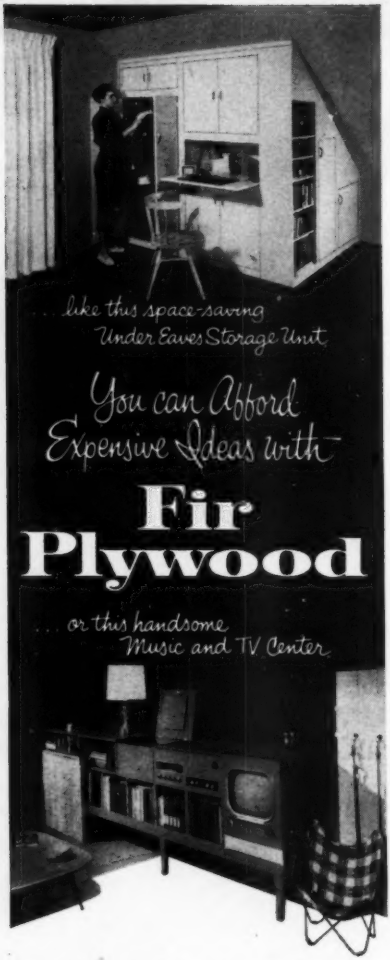


AC FUEL PUMPS

GM GENERAL MOTORS

AC SPARK PLUG

THE ELECTRONICS DIVISION OF GENERAL MOTORS



Give your home the "custom touch" with fir plywood. Whether you use it for smart, good-looking built-ins . . . strong, rigid subfloors and sheathing . . . or distinctive exterior siding—you'll find fir plywood fits your plans *and* your budget. Created by nature, improved by man, fir plywood is real wood made larger, stronger . . . better looking and more versatile.

Grademarked for your protection, fir plywood comes in standard grades as well as special textured or overlaid panels. DFPA industry grademarks attest quality, performance, value.

DFPA TESTED QUALITY

Plans Available; See your lumber dealer or write (U.S.A. Only) Douglas Fir Plywood Association, Tacoma 2, Wash., Dept. 11. Please order plans by name, enclose 10c for each.

GRAVELY makes tough Jobs EASY!

Powerful!

Rotary Mower is only *one* of 21 tools . . . 5-HP Gravely Tractor does every lawn, garden, field job *easier, better*! All-gear Drive, Power Reverse. New "Power vs Drudgery" Booklet FREE! Write today . . . and ask about the NEW EASY PAY PLAN.

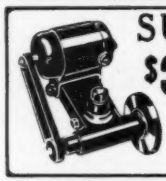
(Push-button Starter Optional Equipment)

GRAVELY
BOX 684 DUNBAR, W. VA.
FIELD-TESTED FOR 34 YEARS

EXCLUSIVE DOUBLE-BEARING
HEAVY DUTY PUMPS
IRRIGATE • DRAIN • CIRCULATE • SPRAY
Up to 7,500 GPH; 1,000 GPH 60' high; or 3,000 GPH from 25' well. Use ¼ to 1 HP motor. 1¼" inlet; 1" outlet. Stainless shaft. **TYPE X**—2 oil-less bronze bearings. Won't rust..... **$10.95**
TYPE XB—Ball bearing model. Best for belt drives..... **$12.95**
Postpaid if cash with order.
Don't delay—send for yours today!
MONEY BACK GUARANTEE
Centrifugal and Gear Pumps in All Sizes
LABAWCO PUMPS, Belle Mead 4, N. J.

MAGNETS

5 Assorted Size Magnets $1.00. Powerful **Pocket Magnet** W/case $1.00. **Hot Pad** Magnets—large size 8/$1.00. **Bulletin Board** Magnets 8/$1.00. **Slender Magnets**—pencil type 2/$1.00. **Retrieving Magnets**—extra power, heavy duty—30 lb. pull $4.00, also 50-75-100 lb. pull.
Explore, learn Electricity, Magnetism, Electromagnets, complete kit and instructions with 22 experiments and models.....$3.98
TRANSISTOR RADIO KIT—all parts & instructions—powerful..$7.98
Also—Rods, discs, bars, horseshoes
Send stamp for catalog—specify your requirements—10 Satisfaction Guaranteed.
PARK MAGNETS, 666, 1557 Green Bay Road, Highland Park, Ill.

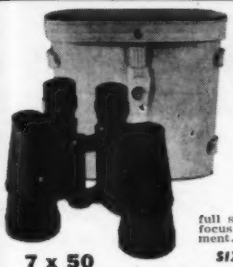


SURPLUS SALE
$39.50 Less Grinding Wheel
NEW TOOL POST GRINDERS
REGULAR PRICE $125.00
1-6 H. P. MOTOR
TAKES WHEELS UP TO ½"x4"
EXTRA QUILL EXTERNAL OR INTERNAL $19.50
MONEY BACK GUARANTEE
EDWARD J. NOLAN, PULASKI, NEW YORK

BUILD YOUR OWN
AIR CONDITIONERS
From Junked Refrigerators for a Few Dollars
INSTRUCTION BOOKS SHOW YOU HOW . . 75c EACH
"HOW TO BUILD a Low Cost Air Conditioner"
"HOW TO BUILD an Automobile Air Conditioner"
"HOW TO BUILD a Low Cost Home Freezer"
"HOW TO BUILD an Electrostatic Precipitator"
"HOW TO BUILD a Low Cost Dehumidifier"
Special Offer
2 Bks - $1.00
3 Bks - $1.50
or all 5 for $2.00
FREE! Instructions and Literature on kits.
Complete "Install-It-Yourself" Air Conditioner kits for home and automobile. 2 Ton capacity. Brand New Parts—$124.40 and up.
KOOL ENGINEERING CO., Dept. X-6, 3716 Belmont, Chicago 18, Ill.

DITCH-WITCH TRENCHER

Portable DITCH-WITCH digs 4½" or 6" clean, even ditches to 36" depth in all types of soil. Four rugged models. Complete unit—self-propelled. OUTDIGS 8 MEN
Write for Illustrated Literature
The CHARLES MACHINE WORKS
637 B Street Perry, Oklahoma



SLIGHTLY BLEMISHED CASES

Message to POPULAR SCIENCE READERS. Our last inventory revealed quite a quantity of binoculars whose cases have a slight blemish, which prevents them from being sold at regular retail prices. The cases are genuine pigskin. All binoculars are NEW, PERFECT in every respect.

BINOCULARS are wide field (all coated optics), full size, calibrated for individual focus and interpupillary adjustment. They are made in Japan.

SIX MODELS ON SPECIAL

7 x 50
7 Power large objective. The most popular Am. binoculars (87 on hand). Reg. retail price $40.00
Special Price $19.72 ppd.
Plus 10% Fed. Tax

8 x 30
A favorite plains glass. 8 Power (35 on hand). Reg. retail price—$35.00
Special Price $16.84 ppd.
Plus 10% Fed. Tax

12 x 50
12 Power. The most powerful in std. length (30 on hand). Reg. retail price—$60.00
Special Price $23.48 ppd.
Plus 10% Fed. Tax

8 x 40
A special wider angle model. Reg. retail price—$69.50
Special Price $26.90 ppd.
Plus 10% Fed. Tax

7 x 35
7 Power. The special wide field design always scarce (58 on hand). Reg. retail price—$49.95
Special Price $22.46 ppd.
Plus 10% Fed. Tax

6 x 30
The standard 6 Power (67 on hand) Reg. retail price—$30.00
Special Price $15.99 ppd.
Plus 10% Fed. Tax.

TO ORDER: Send check, cash or m.o. Send $5 deposit on ea. pair for C.O.D. Binoculars shipped complete with cases and 2 straps, well packed and insured. RETURN WITHIN 10 DAYS FOR FULL REFUND IF YOU DO NOT CONSIDER THESE THE MOST REMARKABLE BARGAINS YOU HAVE EVER SEEN. Calif. resid. add 4% state tax.

MARS NEAREST EARTH SEPT. 7, 1956
Shows Icecaps, Deserts, Etc.

151 Power Space Scope $89.50 ppd. Complete with hardwood case

SO POWERFUL . . . YOU MUST SWEEP IT ACROSS THE MOON TO SEE ALL ITS MOUNTAINS, CRATERS, AND DESERTS. The greatest value in astronomical telescopes ever. Will show you the moons of Jupiter, the rings of Saturn, with brilliance and pinpoint clarity. It is massive, stable and big, about 7 ft. high when fully extended. Has both universal micro and free-swinging adjustments. May be locked at any exact position. 6X searching scope with crosshairs, both straight through viewing and prismatic attachment. Achromatic lenses included: 151X, 73X, 35X, 28X, integral sun filter. Objective lens: 60MM. Shipped carefully packed, padded, insured in hardwood cabinet. If made in this country this instrument would have to be sold for about $500. The Space Scope is a product of the very fine optical industry which has developed in Japan as a result of German assistance during WW II. We are the designers and direct importers, offering the Space Scope direct from factory to you.

TO ORDER: Send check or money order. $20 deposit on C.O.D. As usual, our 10-day money-back guarantee applies. Calif. resid. add 4% state tax.

When in Los Angeles visit the two unusual Akron Dept. Stores

THE AKRON, 4415 Sunset Blvd., Los Angeles 27, California

New! FROM **MARQUETTE**

Model "31" AC WELDER

Made to order for...

HOME SHOPS
REPAIR SHOPS
115V/230V

WRITE TODAY!

MARQUETTE MANUFACTURING COMPANY, INC.
307 EAST HENNEPIN AVE. • MINNEAPOLIS 14, MINN.

NEW! ELECTRICALLY HEATED **RECLAIMO**
*A Wm. Schwalge Product

Oil RE-REFINING Filter

Super-Efficient Filtration

for TODAY'S Car-Truck-Tractor Engines

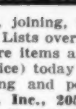
INCOMPARABLE PERFORMANCE!! RECLAIMO —REMOVES Solids—PREVENTS Excess Water Accumulation, Acid and Sludge Formation —CHECKS Fuel Dilution—MAINTAINS Stable Viscosity! Keeps engines "young and frisky" with crankcase oil in peak lubricating quality at all times. FULLY GUARANTEED.

ENDS NEEDLESS OIL CHANGING!

NEW FEATURES: Electric Heat from generator, thermostat controlled—**Dual Flow** by-pass—**Steel** noncorrosive body—**Hinged** mounting bracket—**Easy** to install or transfer to other equipment.

JUDGE FOR YOURSELF! Each Reclaimo is sold with an unconditional 6 months' no-risk return privilege.

Write for folder with full details.
RECLAIMO MFG. CO., Dept. S-66, 6251 Touhy Ave., Chicago 30, Ill.
Manifold-heated Reclaimos NOW OBSOLETE, accepted (new or used) for trade-in.



***Wm. Schwalge, Author, Inventor, Pioneer in oil reclaiming since 1910.**

HERE IS THE LUMBER YARD KNOWN AROUND THE WORLD

GET YOUR COPY OF THIS 126 PAGE MANUAL

It contains illustrations and descriptions of all the woods, tools, material and facilities the editors of Popular Science write about in this issue. World's largest selection of rare woods, veneers, inlays, lumber, plywood, shown in natural color. Instructions on wood finishing, veneering, joining, making inlays and inlaid pictures. Lists over 2,000 unusual hard-to-get hardware items and tools. Send 25c (special offer price) today for your manual to cover mailing and postage. **Albert Constantine & Son, Inc., 2054 Eastchester Road, New York 61, New York.**

TEAR OUT • MAIL TODAY

Albert Constantine and Son, Inc.
2054 Eastchester Road, New York 61, New York
Gentlemen: Enclosed is 25c please send me your master manual.

Name.....

Address.....

City.....Zone....State.....

When in New York visit our modern mail-order plant and display room.

Mammoth 1956 Wholesale Tool Catalog

$1.00 Puts You In Business

The opportunity now awaits you to own and operate your own business on a part time or full time basis in the lucrative field of HARDWARE, APPLIANCES, BICYCLES, CAMERAS, HAND TOOLS, FANS, POWER TOOLS, MOTORS, PAINTS, etc., or BUY TOOLS FOR YOUR INDUSTRIAL OR INSTITUTIONAL USES.

Buy Nationally Advertised Tools for Resale or Industrial or Institutional Use

NO INVESTMENT REQUIRED. BUY AS YOU NEED IT. A MILLION DOLLAR INVENTORY AT YOUR FINGER TIPS.

Discount UP TO 50%

$1.00 refund on first purchase or refund if you are not 100% satisfied.

Every one needs tools. Meet the demands of the growing "Do-it Yourself" markets. Sell direct from the jumbo buying guide—your cost is known only to you.

JUST FILL OUT COUPON

SILVO HARDWARE CO.
Dept. PS-6
108 Market St.
Philadelphia 6, Pa.

I am enclosing $1.00. Rush me your dealer's mammoth Catalog Today. If I am not completely satisfied with your plan, I understand that I can return the Dealer's Catalog for refund, and if I decide to order, my $1.00 will be deductible from my first order.

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

The Modern PLASTIC for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. The big 4-lb. can is obtainable from your lumber, paint or hardware dealer at $1.25; or will be shipped direct postpaid (in U. S.) for $1.50. Complete satisfaction guaranteed or your money refunded. Order now.

DONALD DURHAM CO.
Box 804-U Des Moines, Iowa

Paint STRIPES with New "PAINT PEN"!

Straight, Curved or Parallel Lines

Use like a fountain pen with any color paint to stripe furniture, bikes, autos, model planes, toys, linoleum, wall board. Beautiful clean, crisp results every time. Can't clog or smear. Also use with glue, tempera, textile paint or ceramic under glaze. Paints on wood, glass, plastic, metals, fabrics and paper. Tool complete with tip for 1/16" stripe only $1.25 postpaid. Other complete tools with following tips, 1/64", 1/32", 3/64", 5/64", 3/32", ⅛"—$1.75 each. Extra tips 90c each. Entire kit with tool and 7 tips—$5. A ¼" tip only $1.20 each. C.O.D.'s postage collect.

New! "DOUBLE-STRIPE" 5 Way Combination Model only $3.25
Double Stripes—one wide and one narrow or two wide or two narrow at the same time.

FREE Send postcard for complete information—or ORDER TODAY.

$1.25

DEALERS: Master Paint Striping Tool in display cartons of 1 doz. FAST, PROFITABLE SALES. Write for new discounts.

HOME CRAFTSMEN! New Paint Striping Tool gives "professional" results every time, simple, easy to use. Send $1.25 now.

MANUFACTURERS: Write today for information about industrial models and production striping tools.

WENDELL MFG. CO., Dept. 218
4234 Lincoln Ave., Chicago 18, Ill.

GENUINE ALNICO MAGNETS

AMAZING, PERMANENT, NON-ELECTRIC, HIGHLY PRACTICAL. Conduct interesting experiments. Hundreds of uses. Retrieve valuable steel items such as guns, tackle from fresh or salt water; tools from tanks & drains. **GUARANTEED.** Try any magnet one week. Money back if you are not well-pleased.

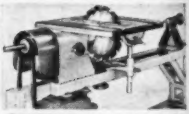
No. S-710	Has pull of 225 lbs. on flat steel block	$16.50
No. S-625	Has pull of 125 lbs. on flat steel block	$ 9.50
No. S-575	Has pull of 75 lbs. on flat steel block	$ 6.50
No. S-500	Has pull of 50 lbs. on flat steel block	$ 4.50
No. S-47	Hot Pad Magnets 10 for $1.00	50 for $ 4.87
No. S-35	Hobbyist assortment of 8 small magnets	$ 1.50

Send M.O. or check. We pay postage. Sorry no C.O.D.'s.

MIAMI MAGNET COMPANY, 3240 N. W. 27th Ave., Miami 42, Fla.

RETAIL PRICE $125.00

FACTORY TO YOU $79.95



SUPERSHOP includes precision-built 8" tilting table saw, vertical and horizontal drill press, 30" lathe, sander, grinder. **100% BALL BEARING.** Write for FREE catalog, full details, trial plan.

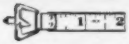
POWER TOOLS, INC. 284 YATES AVE. BELOIT, WISC.

EXPLORE FOR TREASURE!

Find gold, silver, coins, jewelry, battle relics! Treasure—Metal—Mineral Detectors. M-SCOPE. Used worldwide for Treasure Hunting. Mineralights, Geiger, Scintillation Counters. Prices from $14.75. Fully GUARANTEED. Time Payment Plan. FREE Treasure and Uranium booklets. New outfitting catalog. FISHER RESEARCH LAB., INC., Dept. PS-1, Palo Alto, Calif.

Insist on *Evans* TAPES
50 ft.-100 ft. long
At your hardware store
For building and gardening measuring.

from $4.98

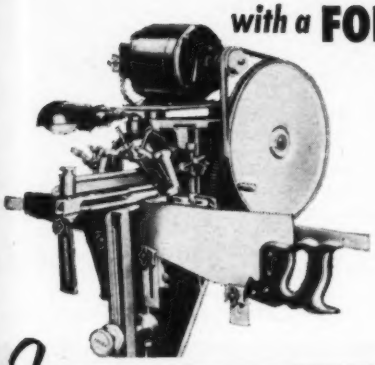


each with FREE plastic utility case and SPECIAL HOOK-RING ATTACHMENT FOR EASY ONE-MAN MEASURING

EVANS RULE CO., Elizabeth, N. J. 3069

Last year's profit $3,000!

with a FOLEY AUTOMATIC SAW FILER



"Last year's profit amounted to $3,000. Not so bad for a one-man outfit"—from Chas. C. Hough. James B. Williams wrote us—"I made $765 last year filing saws, and it sure comes in handy. I do this work in my spare time." Men in communities of all sizes make up to $3 or $5 an hour with the Foley Saw Filer working full time or part time.

It's no trick to take care of the saw filing for your neighborhood hardware or lumber dealer — plus looking after the saws for farmers, townspeople, manual training departments and factories. The Foley files all hand saws, also band and cross-cut circular saws. It's a repeat cash business, no canvassing, no eyestrain and no experience needed.

Send Coupon for FREE BOOK

SHOWS HOW TO START

"MONEY MAKING FACTS" shows just how you can start at home in your spare time working in your basement or garage. It's an immediate cash business that can develop into a full-time repair shop. Send coupon today—no salesman will call.

FOLEY MFG. COMPANY
619-6 Foley Building, Minneapolis 18, Minnesota
Send me free book "MONEY MAKING FACTS"

Name_____

Address_____

HUNTERS! CONFISCATED RUSSIAN RIFLES $14.95

RUSSIAN RIFLE AMMUNITION FREE

20 rounds full jacketed ammo included with each rifle purchase. Additional cartridges: $7.50 per 100 rds. This ammo is for the Russian Moisin 7.62 MM, and also for the Moisin Nagant. We also now have 7.62 MM softnose hunting ammo., 150 gr for deer, bear and No Amer. big game, 20 rds. $2 95.

GOLDEN STATE ARMS CORPORATION
154 ARMORY BLDG., 1165 E. Colorado St., Pasadena, Calif.

This is the late Russian Model 7.62 MM Moisin Rifle, appr. 30" barrel. Mechanically perfect. Outside: good. Bore: fair. Ballistics: 2820 FPS with 150 grain bullet. Ammunition available everywhere in U.S., an excellent hunting cartridge. Hinged floor plate. Russian ordnance marks on receiver. The Russians won the International Meet in Venezuela (1954) with this model rifle. These guns were confiscated from Communist revolutionaries and placed on the free world market. They are of the type used by Red Chinese in Korea. The sale of these guns in no way aids any country behind the iron curtain. A Once-In-A-Lifetime collector's item. This is the lowest price we have ever seen which would allow a man to equip himself for big game hunting. For C.O.D. Send $5 deposit. Calif. residents add 4% state tax.

SET OF 3 PAINT BRUSHES $1.29

SURPLUS BIG BARGAIN OFFER

All-purpose Genuine Bristle Quality Brushes for the Do-It-Yourself painting of Furniture, Walls, Woodwork, for any paint job inside or outside. Set consists of a 1", 2" and 3". Finest quality brushes vulcanized-in-rubber. All 3 actually cost less than you could pay for any one of these brushes elsewhere! Only $1.29 plus 25c PP. (Only 3 sets to a customer.)

PLUS 25c PP

Money Back Guarantee

MATTHEW DAY CO., INC., Dept. PS-6, Dumont, New Jersey

NEW BENJAMIN SUPER CO_2 GAS CARBINE — $16.50

HI-LO (2 Stages) Jet Power
Cal. .177 or .22
RIFLED
Shoots
Pellets
& Darts

IDEAL FOR TARGET & SMALL GAME
SAFE—ECONOMICAL—ACCURATE
CONVENIENT—PRACTICAL—NON TOXIC

EASY TO OPERATE—NO PUMPING—NO FLINCHING. Get 40 SHOTS from each 10¢ STANDARD SIZE CO_2 (Soda) CARTRIDGE. Up to ¾" penetration. Ask your DEALER for DEMONSTRATION.

New Benjamin .177 or .22 CO_2 ROCKET Gas Pistol with HI-LO JET POWER..... $15.00

BENJAMIN AIR RIFLE CO.
852 MARION ST., ST. LOUIS 4, MO., U.S.A.

FREE Folder

NOW! HOME CRAFTSMEN CAN OWN THIS PROFESSIONAL ARC WELDER

EASY TERMS ONLY $98.50 F.O.B.

Trindl "NO TESTED" ARC WELDERS

FREE
WRITE FOR COMPLETE DETAILS AND EASY PAY PLAN

Now you can own a Trindl full 125 amp Industrial Welder at a price far less than smaller machines. With a Trindl 125A you can weld metals up to ½ inch thick. Operates off either 110 or 220 volt line, properly wired. 16 heat stages from 20 to 125 amps. Make and repair anything of metal around the home, garage, farm or shop, like a professional. No previous experience or training needed. Full "do-it-yourself" instructions with each machine. Complete only $98.50 f.o.b. factory, or write for details. Trindl manufactures a complete line of heavy duty welding machines. Dealer inquiries invited.

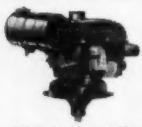
TRINDL PRODUCTS Ltd., Dept. T3-X
1807 So. Clark St., Chicago 16, Ill.

Trindl "NO TESTED" ARC WELDERS

Guaranteed
12 MONTHS IN CONTINUOUS OPERATION

Building a scooter or midget racer? Need a new engine on your lawnmower? Best power for ANY job within their range is one of these newest Red Seals. Greater piston displacement, for power in excess of rating—plus more "lug" at low speeds, eliminating stalls. Exclusive Contex ignition system speeds and simplifies adjustment, doubles life of points and plug, and low oil level ignition cutoff ends hazards of running dry. 14 rugged models, horizontal and vertical shaft. Write TODAY for name of Red Seal dealer nearest you.

AU Series Horizontal Shaft



AD Series Vertical Shaft

CONTINENTAL MOTORS — Beautiful as the Nation — AMERICA'S STANDARD

Continental Motors Corporation
INDUSTRIAL AIR-COOLED ENGINE DIVISION
12800 KERCHEVAL AVE., DETROIT 15, MICH.

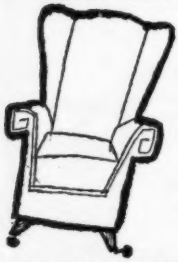
NOW—THE QUICK-WAY TO SHARPEN ALL CIRCULAR SAWS — NEW

Model PG-12 Complete No extras to buy. $16.50 Postage Paid

Model PG-12 sharpens, joints, gums, and retooths all cross cut, rip, combination, miter, and planer blades up to 12" in diameter. Two precision index plates give versatile, accurate sharpening. Guarantees precise spacing of teeth. New safety rest prevents tilting and gouging of blade. Save time and money. Special $3.00 grinding wheel also included for use on your own power table. Fits regular or radial swing tables.

Order today. Send check, cash, or money order. We pay postage.
QUICK-WAY SAW CO.
100 Hornby Drive, Painted Post, N. Y.

Loose Castor?



Anchor it with *New* Plastic Wood. Makes a permanent fix that won't crack, chip or peel. And *New Improved* Plastic Wood has a finer grain—minimum shrinkage! Takes stain, lacquer and varnish with excellent results.

NEW "PLASTIC WOOD"®

Handles like putty—hardens into wood.

BUY DIRECT & SAVE 50%

NEW LOW PRICES ON FAMOUS SEA HORSE DIVING LUNGS

Demand type—Rebreather—Constant Flow—Complete—Ready to Use.....$18.95 to $99.50

SPECIAL—Build it yourself Diving Lung. Two hours underwater time. Refills only 25c. You can assemble this in one evening. Complete, New, everything included. Only..... **$39.50**

Send 10c for Informative, Illustrated Catalogue

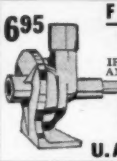
DIVE-CRAFT, Inc., WILMERDING, PA.

SOUTH BEND
LATHES
DRILL PRESS
SHAPER

9" to 16-24" Lathes — 14" Drill Presses — 7" Bench Shaper

Write for literature—indicate machine.

SOUTH BEND LATHE, SOUTH BEND, IND.



6.95

FREE — WIN A TRACTOR — WRITE FOR ENTRY BLANK — NOTHING TO BUY — FREE

HEAVY OILIPH-BALL BEARINGS PUMPS MILLIONS OF GALS.

IRRIGATE, SPRAY, DRAIN OR FILL ANYTHING—ANYWHERE! Will not Rust—Clog—or Leak. Patented Seal. Pumps 2800 gph. 420 gph at 75' high or 1600 gph from 25' well. Six blade impeller. Threaded for pipe. ¾ Inlet, 1½ outlet. Use ½ to ¾ hp motor . . 7500 gph 9.95
Heavier 2800 gph 8.95 — Heavier 11.95

Check, MO or COD—Money Back Guarantee

FREE Literature—Comparison Charts

U.A.T. MFG. & ENG. CO. HICKSVILLE 273, NEW YORK

Wholesale! TOOLS! GUNS! CAMERAS!

BUY TOOLS PHOTO EQUIPMENT, SPORTING GOODS, JEWELRY AND THOUSANDS OTHER NATIONALLY ADVERTISED PRODUCTS AT BIG DISCOUNTS. SAVE ON OWN PURCHASES. BIG PROFITS SELLING TO OTHERS. *POSTCARD BRINGS FREE COPY "THE WHOLESALE PLAN"*

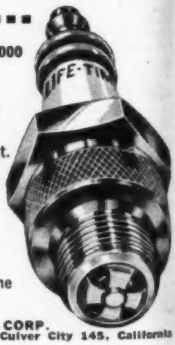
Get up to 40% off

AMERICAN BUYERS SERVICE

HERTEL STATION, DEPT. 8, BUFFALO 16, NEW YORK

we're sorry...

that we have not had the production to supply all the demand for **Life-Time 50,000 Mile Spark Plugs.** New equipment and greatly accelerated production enable us now to make immediate delivery.
If you have ordered and your check has been returned, please place your order again. **Life-Time Spark Plug Sets** may be ordered from this advertisement. We will postpay at regular retail price. Specify make, model and year of car. **Set of 6, $7.14; set of 8, $9.52.**



DISTRIBUTORSHIPS

Some additional distributorships are now available. If you have already written us regarding your area, please contact us again. If you have not written before, please send us an outline of your previous business experience and qualifications.

CONTINENTAL MANUFACTURING CORP.
Washington Blvd. at Motor Ave. — Culver City 145, California

One torch kit does all three!

It Solders! Small soldering tip and a box of Kester solder lets you fix jewelry, radio, toys, appliances, etc.—also helps with hobbies like model building!

Burns with big flame! Utility burner head gives you big-burning, sootless flame for repairing gutter leaks, laying tile, thawing pipes, lighting fires up to 2300°F. To light, just strike a match and turn a valve . . . no pumping, no dangerous liquid fuels. Disposable propane gas cylinder lasts for months of normal use, replaces for only **$1.69** at most hardware stores.

Or pinpoints the heat! For fine work, the pencil burner focuses your flame to a narrow point, for antiquing furniture, sweating copper fittings, unfreezing bolts, and other precision operations. All tips are interchangeable on Bernz-O-Matic Torch.

Tackle any job that needs heat!

BERNZ O MATIC®

UTILITY TORCH KIT:

Cylinder, utility burner head, pencil burner, soldering tip, supply of solder . . . **$10.90 VALUE FOR ONLY** **$7.49**

DELUXE ALL-PURPOSE KIT
Tackles anything from soldering to tiling. Flame spreader—burns paint faster. Cutting tip—for cutting linoleum, wood burning. Soldering tip, utility burner head, pencil burner and cylinder are all included to give you the most complete shop torch in a single compact kit! A sensational $13.15 value for only **$8.88**

HANDY SOLDERING KIT . . .
Also gives other torch uses
Makes your soldering job easy. Cylinder, fine soldering tip and a package of solder let you tackle home, toy, radio, auto repairs. Includes pencil burner unit for silver soldering, putty softening, singeing fowl, etc. Soldering Torch Kit: A big **$8.95** value for only **$6.95**

Double your do-it-yourself fun! See these kits—and a demonstration of Bernz-O-Matic instant-lighting torch—at your hardware store. Write for FREE Torch Do-It-Yourself Book!

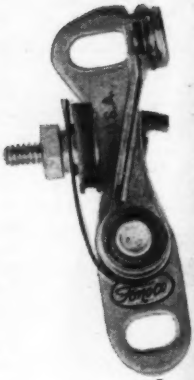
OTTO BERNZ CO., INC., 770-6 Driving Park Avenue • Rochester, New York

For your Ford... always specify the distributor points with the

TRIPLE LIFE!

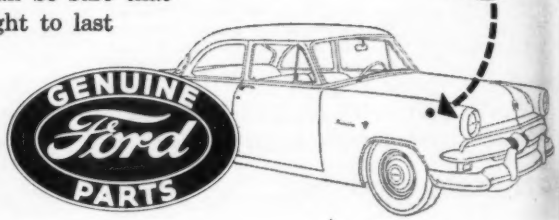
"The unique surfaces of Genuine Ford Distributor Points are *self-cleaning,"* says James Oldham, Ford's Chief Ignition Engineer. "This helps them last up to three times longer than ordinary points."

All Genuine Ford Parts are made right to last longer in your Ford!



Whenever *any* replacement will add to your Ford's performance, always make sure that you specify a Genuine Ford Part, the part that's made to Ford specifications.

For Genuine Ford Parts have to prove they can "take it" in exhaustive Ford track tests, before they're awarded the Genuine Ford label by Ford Engineering. Subjected to as much as fifty times the abuse they would normally get in actual service, you can be sure that they're made right to fit right to last *longer* in your Ford!



Keep your Ford all Ford

GENUINE Ford PARTS

I WAS TIRED OF WAITING FOR "SOMEDAY" I MADE UP MY MIND TO ACT! I GET THE TRAINING I NEEDED...SOMEHOW!
I HAD PLENTY OF EXPERIENCE AND THE BOSS SEEMED TO LIKE ME. I LACKED JUST ONE THING—
SKIPPED ME AGAIN!

SKIPPED ME AGAIN!
POOR BURT! HE MISSED OUT ON THAT PROMOTION AGAIN!
I WAS DETERMINED TO MAKE GOOD IN MY JOB...BUT DETERMINATION, I FOUND, WAS NOT ENOUGH!
I HAD PLENTY OF EXPERIENCE. AND THE BOSS SEEMED TO LIKE ME. I LACKED JUST ONE THING— TRAINING!
SORRY, BURT! I KNOW YOU'VE WORKED HERE LONGER. BUT TED HAS THE SPECIAL TRAINING WE NEED. YOUR CHANCE WILL COME ...SOMEDAY!
I WAS TIRED OF WAITING FOR "SOMEDAY." I MADE UP MY MIND TO ACT! I'D GET THE TRAINING I NEEDED...SOMEHOW! JANE HAD A SUGGESTION...
I CAN'T QUIT MY JOB AND GO BACK TO SCHOOL! AND I SURE DON'T WANT THAT NIGHT CLASS ROUTINE IN THE CITY!
WHY NOT STUDY AT HOME?...THE WAY DAD DID... WITH I.C.S.!
JANE SHOWED ME AN I.C.S. ADVERTISEMENT IN POPULAR SCIENCE. THERE WAS THE FAMOUS COUPON. AND THERE WAS EXACTLY THE COURSE I WANTED...
SAY, THEY'LL SEND ME A CAREER KIT FREE... THREE BIG SUCCESS BOOKS.
DAD SAYS HE NEVER WOULD HAVE BEEN MANAGER IF IT WEREN'T FOR I.C.S.
ONE MONTH LATER...
THE I.C.S. METHOD MAKES IT EASY! WHAT I LEARN TONIGHT I CAN PUT TO USE ON THE JOB TOMORROW. THIS IS WHAT I CALL REAL LABORATORY TRAINING. IT WORKS RIGHT IN WITH MY JOB!
SIX MONTHS LATER... I KNEW MY BOSS WAS KEEPING TRACK OF MY PROGRESS. THEN ONE MORNING...
BURT, I'VE JUST MADE YOU THE ASSISTANT MANAGER OF YOUR DIVISION...AT $15 MORE A WEEK. AND THE WAY YOU'RE GOING NOW, THIS IS JUST THE BEGINNING.
GOSH! THANKS, MR. TAYLOR!
I GOT IT, HONEY! I GOT THE PROMOTION! OUR MONEY WORRIES ARE OVER! TODAY'S OUR LUCKY DAY!
TODAY AND THE DAY YOU MAILED THAT I.C.S. COUPON!
WHY NOT MAKE THIS YOUR LUCKY DAY? LET I.C.S. PUT YOU ON THE ROAD TO MORE PAY, RAPID ADVANCEMENT, REAL JOB SECURITY. HERE'S THE FAMOUS COUPON. MAIL IT NOW!

For Real Job Security—Get an I. C. S. Diploma! I. C. S., Scranton 9, Penna. Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS

65TH YEAR

BOX 90641F, SCRANTON 9, PENNA.

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

(Partial list of 256 courses)

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning—Refrig.
- ☐ Architecture
- ☐ Architectural Interiors
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Building Maintenance
- ☐ Carpentry and Mill Work
- ☐ Heating
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Cartooning
- ☐ Commercial Art
- ☐ Fashion Illustrating
- ☐ Magazine Illustrating
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Auto Body Rebuilding
- ☐ Auto Elec. Technician
- ☐ Auto-Engine Tune Up
- ☐ Automobile Mechanic

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Advertising
- ☐ Bookkeeping and Accounting
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Public Accounting
- ☐ Creative Salesmanship
- ☐ Federal Tax
- ☐ Letter-writing Improvement
- ☐ Office Management
- ☐ Professional Secretary
- ☐ Retail Business Management
- ☐ Sales Management
- ☐ Stenographic-Secretarial
- ☐ Traffic Management

CHEMISTRY
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Natural Gas Prod. & Trans.
- ☐ Petroleum Engineering
- ☐ Plastics
- ☐ Pulp and Paper Making

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Reading Struct. Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Mine Surveying and Mapping
- ☐ Plumbing Drawing and Estimating
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrical Maintenance
- ☐ Electrician ☐ Contracting
- ☐ Lineman

HIGH SCHOOL
- ☐ Commercial ☐ Good English
- ☐ High School Subjects
- ☐ Mathematics

LEADERSHIP
- ☐ Foremanship
- ☐ Industrial Supervision
- ☐ Leadership and Organization
- ☐ Personnel-Labor Relations

MECHANICAL AND SHOP
- ☐ Gas—Electric Welding
- ☐ Heat Treatment ☐ Metallurgy
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Supervision
- ☐ Internal Combustion Engines
- ☐ Machine Design-Drafting
- ☐ Machine Shop Inspection
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration
- ☐ Sheet Metal Worker
- ☐ Tool Design ☐ Toolmaking

RADIO, TELEVISION
- ☐ Industrial Electronics
- ☐ Practical Radio TV Eng'r'ng
- ☐ Radio and TV Servicing
- ☐ Radio Operating
- ☐ Television Technician

RAILROAD
- ☐ Air Brake Equipment
- ☐ Car Inspector
- ☐ Diesel Engineer & Fireman
- ☐ Section Foreman

STEAM AND DIESEL POWER
- ☐ Combustion Engineering
- ☐ Diesel—Elec. ☐ Diesel Eng's
- ☐ Electric Light and Power
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Finishing and Dyeing
- ☐ Loom Fixi'g ☐ Textile Des'ing
- ☐ Textile Eng'r'g ☐ Throwing
- ☐ Warping and Weaving

MISCELLANEOUS
- ☐ Domestic Refrigeration
- ☐ Marine Engineering
- ☐ Ocean Navigation
- ☐ Professional Engineering
- ☐ Short Story Writing
- ☐ Telephony

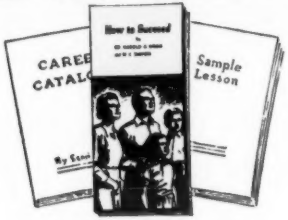
Name_____ Age_____ Home Address_____

City_____ Zone_____ State_____ Working Hours_____ A.M. to P.M._____

Occupation_____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

FREE!



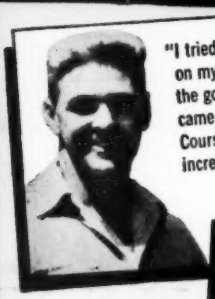
I.C.S. CAREER KIT CONSISTING OF...

1 "HOW TO SUCCEED" 32-PAGE GOLD MINE

2 CAREER CATALOG... OPPORTUNITIES IN YOUR FIELD.

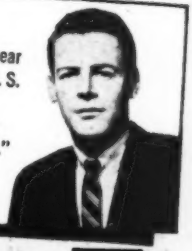
3 SAMPLE LESSON (MATH) SHOWS I.C.S. METHOD.

I.C.S. IS THE OLDEST AND LARGEST CORRESPONDENCE SCHOOL IN THE WORLD. 256 COURSES. PERSONALIZED INSTRUCTION CAREER GUIDANCE, EASY PAY PLAN. DIPLOMA TO GRADUATES.



"I tried studying my work on my own, but I never got the good out of it that came from my I. C. S. Course. My salary has been increased 73.3%!"

E.L.B.
Ohio



"I am president of a small corporation. A year ago I enrolled with I. C. S. as the most practical means available to me to learn what I needed."

W.J.A.
Michigan

Mail this postage-free card today!

No Postage Stamp Necessary If Mailed in the United States

Postage Will Be Paid by Addressee

BUSINESS REPLY CARD

FIRST CLASS PERMIT No. 1000, Sec. 34.9 P. L. & R. : : SCRANTON, PA.

INTERNATIONAL CORRESPONDENCE SCHOOLS

1001 WYOMING AVENUE

SCRANTON 9, PA.

IT'S A PSYCHOLOGICAL FACT: **PLEASURE HELPS YOUR DISPOSITION**

How's your disposition today?

FEEL BADGERED SOMETIMES if things don't add up? That's natural when little annoyances bother you. But it's a psychological fact: pleasure *helps* your disposition. So everyday pleasures are *important.* If you're a smoker, choose your cigarette for utmost pleasure. *Choose Camels — America's most popular cigarette!*

R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

BRIAN KEITH, Star of TV's "Crusader": "I've tried them all. It's Camels for me for good, rich taste, genuine mildness!"

For more pure pleasure—have a Camel

RISE STEVENS, Metropolitan Opera Star: "I choose Camels because they give me so much more pure pleasure out of smoking!"

MARGUERITE HIGGINS, Pulitzer Prize-Winning Correspondent: "No other cigarette gives me the rich taste and real mildness of Camel."

CLAIRE L. CHENNAULT, Major General (Ret.) USAF: "I've smoked Camels over 40 years. They taste so rich, yet smoke so mild!"

No other cigarette tastes so rich, yet smokes so mild!

ON

?
.
your
nt.

, M.C.

poli-
oose
e me
sure